PCPlus CAMPAIGN

➔ This month, we have both praise and condemnation for Evesham.com and we hear from a reader who finally got Time to cough up

Monitor woes

My monitor failed recently and I decided to replace it with a 17-inch CTX PR711F. I have had good experience of CTX monitors, and this model has had good reviews. This was to be my first major purchase on-line. I found the monitor at a good price at Watford Electronics, with free delivery for on-line orders, but was unclear about the stock position. On Friday 4 August I telephoned Watford and was told that the model was available in a satellite warehouse for delivery in five working days. This should have given delivery by the following Friday. I decided to place an order while I was on the phone, despite the delivery charge.

I was away most of the following week, and expected to find the monitor at home when I returned on Friday evening. No luck! On Saturday I telephoned Watford to chase up delivery, to be told that they had none of this model in stock, and did not intend to purchase any more. End of conversation – no apology or suggestion of an alternative. I shall not purchase from Watford again.

I was now in urgent need of a monitor, and 8pm on Saturday 12 August I had located the same model on Simply Computer's Web site. The price was equally good, and free delivery was promised in 3 days. I placed the order, anticipating delivery on Wednesday. At 10pm I received e-mail confirmation of the order, on Sunday at 11am confirmation of the sale, and on Monday at 4pm confirmation of despatch. The monitor arrived at 10am today (Tuesday), just 62 hours after the order was placed. This is exemplary service, and a huge contrast with the non-service provided by Watford Electronics. I know where my business will go in future.

Phil Holland

Watford Electronics took an order for a monitor that they did not have.

Keep at 'em

I am writing to let you know that I am having serious problems with getting Time Computers to complete an order that is now over six weeks old. I enclose a copy of the covering letter. I have sent you the related documents by post. Despite warning Time that I would take legal advice if it did not complete my order, Time has not responded to my complaint. I hope **PC Plus** will be able to help.

Wesley Johnston

OUR REPLY: This case shows that persistence can pay off. We'd just begun to investigate Wesley's problem when we received a second e-mail from him:

As an update to the letter and e-mail I sent to you, Time have now sent me the copy of Encarta that I have been waiting six weeks for. It arrived this morning, two days after I sent the letter. Thank you for your trouble.

Wesley Johnston

Casio's secret upgrade

As one of the many aggrieved Cassiopeia E105 users who thought that they would be able to upgrade their 105's when the new model (E115) came out only to find that this was not possible. I was delighted to read your comments about the offer to trade-in the 105 and swap for a 115 for a one off payment of £155.

I rang the Casio helpdesk on the number you provided and told them that I'd just read the article and wanted to know where to send my cheque and how to do the swap. The lady I spoke to informed me that that offer had finished and was about to cut me off before I told her that I had read it in the September issue of **PC Plus**. She then put me on hold for a minute or two, came back to me and said, "Yes, that offer has ended. There is nothing more I can do. We are not going to be offering the exchange again". I was then promptly (and somewhat rudely) cut off!

Considering that I only read the article about the offer yesterday and Casio had not, as far as I am aware, publicised it, how on earth was I supposed to know?

Thanks Casio. I'm now considering a different upgrade... to one of your competitors machines!

Paul Seymour

Casio finished their offer to upgrade without public announcement, and still didn't apologise for the inconvenience

Poor NTL World support

I wonder if any other readers are experiencing connection problems with ntlworld's free service. Having waited a few weeks for the CD I eagerly installed it on receipt and registered as richard_james. I then tried to connect and got a message saying "invalid user name or password on the domain" – maybe I had to wait a couple of hours or so, I thought, so tried again next day with the same result. Through another account I got on to the ntlworld home site and in the 'server status' section noticed that there are problems currently with the registration server. I do not want to pay £1 per minute to call its Technical Support (why should I, it's not my fault!) so e-mailed them instead. I have done this three times now over a period of seven days with, apart from an

acknowledgement of receipt each time, no technical response whatever. Is this some clever ploy for a free service to gain loads of money by charging £1 a minute on Tech Support conversations and not bother to reply to customer's e-mails? So much for 'free' service, I'd rather pay a few pounds a month for a decent one.

Richard James

Evesham.com castigated

I purchased an Athlon Vivo from Evesham.com in early June and have encountered many problems.

Having collected the new PC from their Evesham showroom I quickly noticed when trying to assemble it that the incorrect speakers had been supplied – and they could not be connected to the PC.

The next working day I rang the company to advise it of its error and agreed to take the incorrect speakers back to its showroom and collect the correct ones. Evesham, however, later rang back to say that the correct speakers had to be delivered and the incorrect ones had to be collected. It was arranged that its courier would call at my work's address. Below is a summary of what has followed: Courier firm call at home address and ring my work's address to say "where are you?".

I manage to take the afternoon off and the courier firm kindly call back and hand me the new, correct speakers. However, they refuse to take back the old pair, stating they have no instructions to collect anything.

Eventually, it is agreed that I will return the speakers myself and Evesham.com provide me with a number – RMA 40112 – to write on the speaker box so that, on receipt, it knows what it relates to. I state that I am unable to return them for two weeks but this is not a problem for Evesham.

Over the next two weeks, quite unannounced and without any arrangement through myself, three more courier calls are made on my home address while I am at work. Fortunately, on the morning of the final visit I happen to be going into work late that day and I am able to hand over the incorrectly supplied speakers (with reference number written on box) to the courier man. Phew – finally got rid of them, or have I?

Two weeks on and, again totally out of the blue, a surprise package arrives and is kindly left on top of my wheelie bin, would you believe, by another courier firm on behalf of Evesham – yes, it is another set of speakers.

The following day, I receive a blunt letter from Evesham.com stating that it has not had its speakers back and could I kindly return them.

I waste the umpteenth hour of my time ringing Evesham.com again and explain what has happened – it has no record of any visits, no collection and certainly no record of more speakers coming out to me. I spend half an hour explaining what has happened and the lady who I speak to says she will look into it.

I spend the next hour rummaging through bins and managed to recover some information – reference numbers, details of the courier visits and so on, I then rang back to advise Evesham. The lady who I spoke to previously had left for the day and, (surprise surprise!), another lady taking the call can't even find any record of the conversation I had an hour ago.

I e-mail Evesham.com and its customer care manager – Rod Thompson – and I am still awaiting his response.

On top of this, the much-trumpeted (by the PC press and the company itself) free Internet for life via Call Net / F1 Racing (no call charges, no subscription fee) pre-installed on Evesham PCs – and the reason which swung it for me to buy from Evesham – has not worked from the moment I purchased the PC. Call Net, of course, stopped taking on new subscribers in early June. Evesham.com took several weeks to even admit it had a problem to me and continue to advertise this deal as if it is still operative and is unique to them. Surely, this is against the Trade Descriptions Act ?

I am left deeply disappointed by this company. It has contrived to turn what should be a problem capable of being rapidly resolved into a complete and utter mess. Floundering in its own incompetence at not having any records of the whole affair (it does ask you for a unique serial number every time you ring, and so should be able to record things.

To drive the final nail in the coffin, it then seemed to want the whole affair repeated by sending out further unrequested equipment, although I'm sure they're a good company for most people.

Peter A Long

OUR RESPONSE: We contacted Evesham.com and got the following reply:

"Thank you for your e-mail regarding Mr Long. We can only repeat what Mr Long himself said – 'I'm sure they (Evesham.com) are a good company for most people'".

"Given the furore created by some of our less scrupulous competitors, we are indeed a good company for most people. We daily receive letters of praise for individual and company efforts to meet our customers' needs.

"We have, through a sense of pride in our company and determination to get to the top of the list of UK PC suppliers, worked very hard over the last 17 years to establish our reputation for service and value for money. However, it is clear that we have to continually strive and reassess our processes to meet the ever-changing expectations of our customers. We can only repeat the apology already given to Mr Long for what was an unfortunate set of events and assure your readers that Mr Long is indeed right when he identifies us as a 'good company'."

Carolyn Worth
Evesham.com

Write in

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→Praise for Evesham

Compensating people for missing work? What will they think of next?

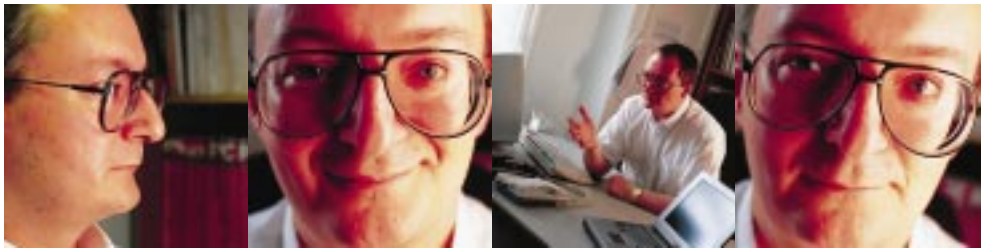
↑ **Computers aren't always reliable, check companies to ensure that they will compensate for lost time at work if needed for repairs**

Last year I purchased a Time machine, which turned out to be unreliable and a lot of trouble, and eventually I was given a full refund. This put me off buying a computer for a while, as I didn't want all the hassle.

But temptation got the better and earlier this year I purchased, at the time, a top-of-the-range PC from Evesham.com with excellent service from the sales person that served me. It is a considerably better and faster machine, and it worked without any major problems, the minor problems were sorted via its excellent 0800 phone helpline, and you do not have to wait too long to be spoken to. But the real praise for the company has to be given for this next event. A major problem occurred with the motherboard and graphics card. The problem resulted in a new motherboard and graphics card being fitted. A day was arranged for fitment and an engineer turned up, but he was given the wrong parts. Arrangements were made for the next day with another engineer, who turned up and fitted the parts and everything is now okay.

During the engineer visits I had to take time off work to be at home for the engineer and as a result lost pay at work. I gave Evesham a phone call and sent a letter of confirmation from my employer to say that I had lost pay. A few weeks later I received a cheque for the full amount of one and a half days' lost pay. Now how many companies will give that kind of service? Keep up the good work, Evesham.

Mr T Gardiner



DavePearman

Justified or not, people are still nervous about sending their credit card details over the Internet. American Express may have the answer...

I**'ve** discussed Internet security problems before, and will do again, I'm sure (*Ad Nauseum – Ed!*). The industry is proud to boast of 128-bit encryption, secure sites, and more security and privacy certificates than you can shake a stick at. So why are many people still reluctant to conduct their business on-line?

Two reasons. First, however impressive the technology, some fool can always screw everything up by pressing the wrong button, or the modern equivalent – dragging and dropping where they shouldn't. Second, hi-tech but low-life scum consider it their sworn duty to break into 'secure' systems (the many insecure ones don't present enough of a challenge) and get their hands on your credit card details.

Never mind that even the insecure ones are probably safer than phoning your credit card details to an anonymous spotty youth in an old fashioned shop. Or handing them to the traditional villain of the piece in columns such as this – the poor, much maligned waiter. No, Essex man (and City Gent, come to that) has heard somewhere, possibly here, that it's 'well dodgy' (or 'a questionable security model'), and that's that.

Well, a new development is imminent that they may just change the minds of such waverers. American Express is about to launch a service called Private Payments, which is staggeringly simple in concept, yet potentially earth-shattering in its significance.

Here's how it works: Instead of sending your credit card details to a grubby on-line Den of Iniquity, you take a minor detour to the Amex site first. Here, you log in securely, and tell the Mighty Green Ones that you want to buy something. You're instantly allocated an account number and expiry date, valid for – and this is the clever bit – one transaction only. You then amble back to the original Web site and conduct your business, safe in the knowledge that even if your card details are appropriated, they're worthless. Once your transaction has been authorised, the number has roughly the same value as a three-Euro note! The cost of the goods are charged to your nominated Amex account, as presumably are any refunds or cancellations. All is well with the World. The sun bursts through the clouds, bathing on-line customers in a warm, comforting light. Cue music.

"All is well with the World. The sun bursts through the clouds, bathing on-line customers in a warm, comforting light. Cue music."

It's so blindingly obvious that you wonder nobody thought of it before. Perhaps they did, but you can still imagine credit card companies around the globe collectively smacking their foreheads and exclaiming "Doh!" at the news. Soon, though, the nagging doubts start to return. Well, they do if you're a cynical old bugger like me, anyway. Let's examine them in no particular order...

"What's to stop someone else logging in as me?" Good point, but who are you more likely to trust – SupaMegaBargins Online.com (established yesterday afternoon), or the fine, upstanding wooden panel and silver cutlery institution that is American Express? Exactly what information will be required to log in is unknown at this point, but at least Amex has an impressive record here (translation: it hasn't scattered its users' confidential details over the Web).

"It's American Express – does anyone take that?" Yes, they do, despite the European misapprehension that it's for Yanks with more money than sense. While merchant charges are rumoured to be higher than Visa and MasterCard, the Internet opens up a global market, and that includes (even, is driven by) Americans. Ignore them at your peril.

"OK, so nobody else can use my number, but how do I know I won't be overcharged?" A common complaint is that innocent punters get charged multiple times for the same transaction, whether due to administrative incompetence or malpractice. Private Payments prevents that, but it doesn't automatically stop the retailer overcharging you for one transaction. Details are sketchy, but if each account is given a credit limit equal to the value of the transaction, this problem can be solved at a stroke, too.

I'm sure you'll think of a few more potential problems, too, as I will after I've written this. However, we actually pay these people for the privilege of having their cards, which says something when everyone else is almost having to pay us. I'm sure many users wonder if it's worth the expense of having an American Express card, but this year they just might have justified the extra cost...

The service is due to start in the United States as you are probably reading this, and I look forward to the day it comes to us here, along with the equally promising-sounding follow-up – Private Browsing. Without a doubt, others will start to offer similar products, and this is A Good Thing.

Private Payments? That'll do nicely.

Write in!

What do you think?
Write and let us know at
PCPlus.mailbox@futurenet.co.uk
or to Dave at dave.pearman@futurenet.co.uk

Martin**Banks**

Setting up your own Web site at home and being your own ISP is the easy answer for small business owners, Martin Banks explains why

It is not something that the average individual might think of in the normal run of events, but it is possible that each of us could become our own 'ISP', rather than have to use a proper service provider. Would we want to? Well, some trends suggest that we might, especially if someone is running a small business.

ISPs tend to be a bit strange about small businesses. They don't mind individuals or even small companies doing a little bit of business via their Web site, but normally they get quite twitchy if the level of business rises too high. After that, the pressure is on to upgrade to one of the business services they offer – for an often not inconsiderable annual fee. But for many small business people, especially the self-employed, that is a jump in expenditure which is far too high.

Over in the USA, things are happening that may have an impact on this situation. A growing number of people are using their own PCs as Web servers, handling their own pages in their own way. Now, I know what you are thinking – having your own Web server sounds like a serious investment, enough to warrant letting an ISP do the job for you. That is not the case in practice. Instead, they are using their old PCs, old Macs and, for one individual I have heard of who is only running an online availability diary, an ancient Newton MessagePad from Apple. This, for those without sufficiently long memories, is a pen-based system that pre-dates the popular Palm machine by many years.

How many of us have got something like that lying around? I certainly have, and I have even more 'out on loan' to friends and family. It is an interesting thought that one of them might well have sufficient capability to act as my own, personal Web server. I can already start to see some opportunities for using it productively, and that is without any thought of the exchange-related programs such as Napster.

There is still a severe lack of widely available, always-on, high-speed connection services to the Internet, and that is what is needed for this to happen. If you're lucky to live adjacent to a cable supplier then you might well be ahead of the game. BT has now made the national TV news programmes with the launch of ADSL, though the story never mentioned why it had taken so unconscionably long to get the service available.

Setting that issue to one side, communications services for the individual are about to get a great deal closer to those already available, for a significant fee, for business users from the ISPs. Couple that with subscription based, un-metered calling regimes and the potential is there for individuals to run proper web-based services from their own machines, in their own ways.

ISPs tend to be a bit strange about small businesses...they get quite twitchy if the level of business rises too high

And, many now believe, that is the way things will go. Though Napster has fallen foul of the world's music business and the US Courts, the music exchanging program has demonstrated to the world at large a serious opportunity in new ways of conducting business.

Indeed, Intel has decided that the peer-to-peer model Napster has exploited is good enough to emulate in a far more formal manner. The company's Paul Gelsinger, its chief technology officer, has gone so far as to suggest that a Napster-like, peer-to-peer approach will change the face of computing, and that the rest of the industry should be ready to jump on the bandwagon.

The company sees itself as driving that particular wagon, for it sees in it a new market for its own technologies. It also sees in the peer-to-peer model the hope of sidestepping what many have seen as an inevitable trend in Net-related computing – the rise of the big centralised server systems feeding out to ever-thinner, ever-more diverse client systems. This is a model of a marketplace where Intel would have a continuing part to play, but it would no longer rule hardware technology and developments in the way it has over the last 20 years.

To help peer-to-peer computing, Intel is to chair a working group consisting of 18 companies, including IBM and HP. This means, in practice, that it has formed the group and roped in a number of its major customers. The company has also set up a research lab to look into the technology and develop of the necessary standards. It goes without saying, that these standards will not include anything significant that Intel can't make.

The company's vision for peer-to-peer computing is that users will build their own, 'self-organising Webs' where communities of users will be able to share facilities and services. An obvious example would be the members of a family, no matter how scattered around the world. But for a growing number – be they self-employed or home-working employees – the communities will undoubtedly be work/business related.

And if the peer-to-peer model strikes a chord with users, then there will be a significant requirement for a huge number of individual small servers (serviettes?) connected to the net. It is one of the interesting side issues of the PC world that end user PCs often have specifications that are the equal of, or better than, many systems branded as 'servers', so there are already thousands of machines lying around capable of doing this job.

The real question, therefore, is whether Intel will ever make the technology available in the form of an add-in board for existing machines... or will they embed it into motherboards in such a way that the only alternative is to buy a new machine. Sadly, I know which option I would bet on.

Write in!

What do you think?
Write to us at
PCPlus.mailbox@futurenet.co.uk, or
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Chris Bidmead

It takes two to tango, but one to make an 'agreement' – according to the makers of a free (or is it?) toy Chris picked up from the States

The Web is watching us and the lawyers are trying to strangle us. No, this isn't a paranoid delusion – the proof is here on my desk. It's a device slightly longer than a mouse, but thinner, sculpted to look like a crouching white panther. Like a mouse, there's a white tail sneaking round to the back of my computer, but instead of wheels or buttons, a malevolent red glow seems to issue from a small black mouth.

This is the CueCat (or, to give it its full punctuation marketing, the ":Cue:Cat"), a cheaply made barcode scanner that is being handed out free to Forbes Magazine subscribers and in RadioShack stores across the United States.

A personal barcode reader typically sells for around $100, so this looks like an extraordinarily good deal. My Stateside chum, Bruce, who picked mine up for me simply walked into RadioShack, asked for his CueCat and walked out with a plastic bag containing the device, a CD-ROM of the software, and an instruction leaflet. With it came RadioShack's catalogue, in which every item is accompanied by – you've guessed it – a bar code that the Cat can read.

The accompanying leaflet from its begetters, a company called Digital Convengence, jauntily announces that you can scan codes from magazine articles, catalogues, advertisements and coupons. "With one 'swipe' the :Cue:Cat reads any product code and instantly transports you to the corresponding web page associated with that product."

Unfortunately, the software accompanying the Cat runs only on an operating system I abandoned back in 1994. The same problem was encountered by one Michael Rothwell, a programmer in charge of the site at www.flyingbuttmonkeys.com. Michael decided to do something about it and wrote a small open source program that would enable the Cat to be used on a wider selection of operating systems. Two other programmers, Jean-Philippe Sugarbroad and Colin Cross had already done some preliminary investigations of the device, and were sharing their code on the Internet, which Michael modestly claims only to have "re-implemented... for the learning experience."

Harmless enough, you might think. In making the Cat more widely usable surely Michael could only be furthering the business purposes of Digital Convergence – whatever they might be. However, no sooner had Michael published the code on his site than he was FedExed a stiff missive from DC's legal advisors. The letter claimed that as DC had "expended vast resources" to bring the Cat and its associated services to the public, Michael's publication of the code was, in some way not specified, "in conflict with intellectual property rights owned by Digital Convergence".

Unfortunately, the software accompanying the Cat runs only on a system that I abandoned back in 1994

There's a facsimile of the letter at the flyingbuttmonkeys web site. It's dated 30 Aug, 2000, it's freighted with the names of all the 145 attorneys who operate under the banner of Kenyon and Kenyon, One Broadway, NYC. Faced with this ocean of shysters, and lacking legal counsel of his own, Michael decided that the prudent course in the short term would be to comply. He duly removed the code.

Naturally the letter raised for him the question of what rights you actually have in respect of a 'free gift' like this. Like my pal Bruce, he had signed no agreement when he picked up the gizmo at RadioShack, although there is a bunch of legalese purporting to cover Cat use at www.digitalconvergence.com/ula.html. Here you learn that the device is only 'on loan to you', that it contains trade secrets and other proprietory information, and that you may not 'reverse engineer, disassemble, modify...' blah blah blah.

To establish wide use of the device they give it away (but see the small print) and this large potential market then levers various vendors into licencing the use of Cat barcodes in their leaflets, brochures and whathaveyou. To connect the barcodes to the appropriate Web site, DC runs a database on one of its own Web sites. Every time you scan a code the software supplied with the Cat connects with the DC database, looks up the URL of that particular barcode licencee, and redirects your browser to it – a service to the public, chargeable to individual product vendors as an exciting new way of extending their sales.

At the time the letter arrived Michael's software was set up so that if it swiped an ISBN number it would go direct to the Amazon.com site to look up the book title. By skipping the DC lookup site the software was circumventing the part of the business model DC doesn't tell you about. Data added by the Cat to every swipe includes a unique serial number. If you've registered with DC, as you must do to acquire what seems to be an totally unnecessary 'activation code' (see www.getcat.com/register.html), every transaction of yours passed through the DC web site will be logged against your personal information.

Potentially nasty stuff, which you get a chance to avoid if you're using free software. Can Digital Convergence legally put a stop to this? I'm not a lawyer, but my mate Bruce in the States is. He says "I wouldn't like to be in the shoes of Digital Convergence's lawyer defending this."

Carry on coding, Michael.

Write in!

What do you think? Write in to us at PCPlus.mailbox@futurenet.co.uk or to Chris at bidmead@cix.co.uk

Into the future

The advances of broadband and flexible screens are set to change our lives by giving us more freedom and more choice

Imagine yourself in 15 years time. You are out walking the dog and suddenly remember that you promised to phone your mother. You whip out your hand-held computer from your back pocket. It has a flexible screen, 2,300GB of data held in the space of your credit card and a processor built from organic molecules that is no bigger than the full stop at the end of this sentence. And it can act not only as a PDA storing a few addresses, but is as fully-functioning PC controlled entirely by voice, so there will be no need of a keyboard or even a stylus. But this hand-held is much more than a PC, it is also a mobile phone, complete with video conferencing, and works as a full entertainment system able to download video and audio on demand.

So you ask the hand-held to phone your mother. She answers and you can see her sitting at home, looking at the flat screen hanging on her wall. The flat speakers are able to relay your voice and microphones hidden in the speakers pick up the sound of your mother's voice. None of the appliances have anything so vulgar as cables connecting them as they are all part of the wireless home network. She tells you about her week. Visiting your sister in Australia and seeing the sights, chatting to a very nice chap in California and best of all browsing round the West End shops all from the comfort of her armchair. Of course, now she does not even have to be bored with the television as she can call up any show or film she wants, even if she does not remember the titles, simply by giving the search engine a rough summary of the plot – and in your mother's case it is only a very rough idea.

As you chat, the wind starts to blow and the fibres in your jacket start to thicken to keep your warm. 

All this may sound a little far-fetched, but all these advances are currently being worked on in labs around the world. Even the jacket is currently being tested by the military. Perhaps the one advance that will have the most impact on all our lives, both at home and in the office, is the introduction of broadband services, both for mobile and static devices. While ADSL and cable are hot favourites for the next few years, these do have limitations when reaching more rural and isolated communities.

LEO satellites

Most of us would like to see fibre-optics being routed right into every home. At the moment the cost is prohibitive, although, should the cabling ever be laid down, services might use a new optical chip dreamt up by the Universities of Washington and South Carolina. The Opto Chip can send 100GB of data per second at low voltages.

However, in the nearer future two new broadband services are being mooted: LEO satellites and LMDS (local multi-point distribution services). LEO (low earth orbit) satellites could eventually scatter the skies at much lower orbits than are currently used. These would carry all kinds of communications networks from mobile phones (as in the Iridium network) to Internet and video on demand. As the satellites are in a lower orbit, the time delays experienced with higher satellites would be eliminated. Of course they will pass overhead quickly at that orbit and so a whole sky full would be needed. But if the satellites could communicate with one another as well as with the earth, messages could be bounced around the globe very fast indeed.

Meanwhile LDMS is a completely different kettle of fish. It is a wireless system that could use equipment placed on existing mobile phone towers to send and receive data. Users would have antenna on their roofs to complete the chain. LDMS is not as fast as alternative technologies, with throughput of around just 155Mbps, but it would be cheap to implement. When, that is, the researchers have worked out how to get the slight difficulties of how to get the signal through impediments such as walls or indeed leafy trees.

Once the broadband signals have reached our homes, there are several competing technologies which we may all be using in a few years time, most of them based around 1394 and HAVi. HAVi is the home audio video interface designed to network the devices in the home, from your VCR to your PC. The specification for first standard was published earlier this year and manufacturers are expected to start using HAVi in their equipment later on this year, or early next year.

Linking the various HAVi devices you can probably expect a wireless FireWire. NEC and Canon have both announced wireless 1394, NEC's version operating at the full 400Mbps at up to 12m for line of sight equipment and 7m through walls, while Canon's can manage 100Mbps at 20m, but as yet it has not been tested through walls. Alternatively you might have 1394 over fibre-optic cable at 400Mbps, as mooted by Electronic Industries Association of Japan.

The Handy hand-held

But let's get back to that groovy hand-held device we first mentioned. At the moment, researchers from MIT, at both the Laboratory for Computer Science and the Artificial Intelligence Lab, are working on a project known as Oxygen. It is based around a hand-held device, known as the Handy 21, which runs alongside a more powerful static device, the Enviro 21 which is also capable of communicating with an array of different devices. Both the Handy and the Enviro run off a network known as Net 21.

Like the hand-held of our example, the Handy will be more than just a PDA but combine a mobile phone and a radio, although future broadband services will be able to expand the services offered by such a device.

The Handy 21 will work using speech recognition, with the user able to put in commands using fairly woolly terms. The team compare the kind of language used as to that you would use with a good secretary. So you would be able to tell the Handy to book you a couple of tickets for a weekend in Barcelona. The Handy would know that unless you tell it otherwise, the other person travelling will be your partner and that you like to fly Business class with a certain airline, and that you will want a certain type of hotel booked for your few days in Barcelona. In other words, the system will be able to understand all the finer points which we often do not say, but simply infer in our speech and carry out our instructions accordingly.

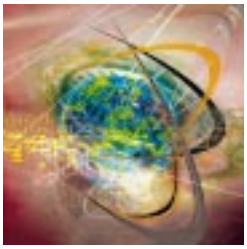
Processor power

One of the more interesting parts of the Handy trial is the novel processor it uses. Called the Raw chip, it is not so much hardwired as flexi-wired. The concept is simple. The processor is divided up into 128 tiles, each with its own wiring and a few memory elements and registers included. By shuffling around the tiles you can rearrange the wiring on the chip, so it could be rewired according to the application the Handy is being used for. In practical experiments this processor has been proved to be much faster than traditional processors.

However, the processors of the future are unlikely to take the form of the Raw chip, as silicon has a very little life left in it. At the moment speed increases are mostly achieved by shrinking the size of the processors. At present we have 0.18 micron processors, but as the size is shrunk even further, so it will become impossible to make the transistors, to place them effectively on the silicon and to run a current through that is strong enough to carry a signal but not so strong that it ends up creating interference for the other signals on the chip. Most estimates place the life expectancy of the silicon processor at somewhere between 10 and 15 years, with the real stumbling block coming as processors reach 0.1 micron in thickness.

IBM has come up with way of etching the silicon die to make it able to take transistors of 0.08 micron, by switching from using an optical beam to etch out the grooves to using an electron beam instead, as this is smaller as it can be sent as a stream rather than as a wave form as in the case of light. IBM has also produced a 4.5GHz processor by simply increasing the number of clocks used in a processor

"LEO (low earth orbit) satellites could eventually scatter the skies at much lower orbits than are currently used"



→ Light emitting polymers

LEP screens will be used in mobile phones, PDAs and televisions

Image courtesy of CDT, www.cdtltd.co.uk

↑ **LEP displays promise to be light, flexible and ultra-portable.**

LEPs have been around for a while in prototype form. It's inventors, Cambridge Display Technologies (yes, they are actually British) came up with the idea of a thin, flexible, low-powered screen and have so far produced both colour and mono versions of the screen. The latest version of the screen, a 2.5-inch square colour screen, has been developed with Seiko-Epson using ink-jet printing techniques to squidge the light emitting polymers on to the substrate backing during the manufacturing process. CDT expects the technology to be used in mobile phones and PDAs, where screens capable of showing video are needed, but expect larger screens to be widely available and used in every situation where you would need a display.

Most people's idea is simply to have these screens in their living rooms as television sets and as access to the Internet, but they could be so much more. Imagine having the tiles in your bathroom made out of LEPs, so you could watch the plains of the Serengeti or the football while you are in the bath. Or you could have an LEP on each wall of your house designed to show a different work of art every day. There is even talk of having LEPs on T-shirts so you can show a video display while you walk down the street.

Electronic paper

Electronic reusable paper made from a layer of plastic may soon be available

Image courtesy of CDT, www.cdtltd.co.uk

Xerox researchers are attempting to create dynamic sheets of electronic reusable paper no thicker than a standard transparency.

Paper is one of the world's best inventions. It keeps for centuries, yet is easy to dispose of. You can fold it and screw it up into a ball, but if you change your mind you can unfold it and still be able to read what is written on it. Any child can use paper and it is one of the cheapest materials around. Last, but not least, in this peon to paper is that it does not need batteries and has a wide viewing angle.

So why would we want electronic paper? It is a matter of convenience. Why carry a whole load of books with you when you could have all the reading you could ever need on one sheet. For example, I can happily globe-trot for months with nothing more than a 30 litre daypack, yet half of it is full of books. Carrying one simple electronic device would be much easier and lighter.

Microsoft's e-book Reader software lets you read books on Pocket PCs. However, the simplest, and perhaps the cleverest, ideas about electronic paper come from Xerox Parc at Palo Alto.

Called Gyricon, it is made from a thin layer of plastic. Embedded in this are millions of tiny beads of a substance a little like printer toner. The beads float in a well of oil that allows them to roll around. One side of the beads are white and the other are black. And, you've guessed it, they roll from one side to the other when an electrical charge is applied.

To change the charge, a printer, small enough to fit into your pocket, could be used, or you could simply write on to the surface with a special pen. Alternatively the paper could be bound like a book with the low-power electronic source being stored in the spine.

known as an Interlocked Pipeline CMOS. However, even Intel admits, in an article written by its employee Paul Pakan in **Science** magazine, that eventually silicon will have to be replaced by either optical or quantum processors.

Quantum processors have long been the dream of many a researcher around the world. There are labs all over the world working on this problem, both in universities and in commercial chip manufacturers. Quantum computers are attractive because they do not suffer from the same problems of heat and electrical interference and, of course, are far, far smaller than traditional processors. Most interestingly, however, they are much faster to switch between states, able to switch around 1,000 times a second, compared to just 100 times for solid state.

"Whatever devices we use in the future, one thing is for sure: they will all be part of a huge communications network that should give us more freedom and far more choice. And everything will include a processor, or at least a sensor, from your hand-held to your fridge and even your toothbrush"

At present, little has been actually achieved in the world of quantum computers. A team from the universities of Stanford and Calgary, together with IBM have come up with a five atom arrangement which has been demonstrated to find the period of a mathematical function, and it is able to do so much faster than a conventional computer. However, it will take another two years to increase the size of this computer to between seven and ten atoms.

Hewlett-Packard and University of California and Los Angeles have taken a different approach and have created a switch out of a layer of several million molecules of rotaxane, while Yale has produced a reversible switch out of 1,000 molecules of nitroamine benzenethiol, sandwiched between metal elements. Switches are not the same as transistors, however, as the latter are also able to amplify the signal travelling through them.

On the plus side, molecules have been demonstrated to be far better memory elements than traditional DRAM. Yale has demonstrated a single molecule memory element able to store information for around ten minutes, an eternity compared to the few milliseconds managed by DRAM. Expect to see organic RAM in three to five years.

Memory could receive a further boost in the not too distant future. A British team from Keele University has come up with a new alloy of materials that can save up to 2,300GB of memory of a chip the size of a PC card. Keele has teamed up with a capital management company, CMR, who intend to market the memory which they claim will be incredible cheap at around £35 a pop and will in time come to replace the hard drive.

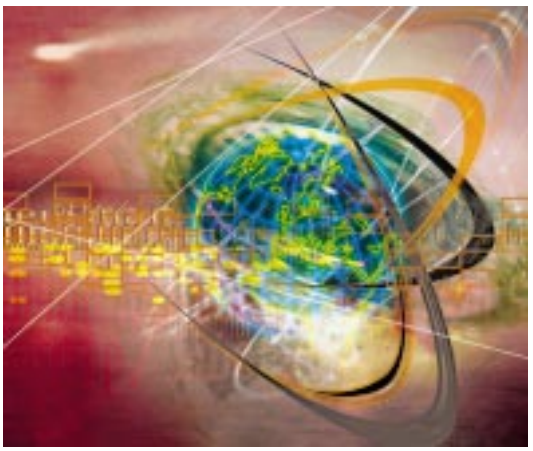
A hard drive replacement is certainly needed. There is one basic problem here – SPE (superpara magnetic effect), which means that when the energy that holds the magnetic spin in the atoms is comparable to the ambient thermal temperature, the atoms can 'flip', that is change their state from a 1 to a 0 and vice versa. Despite new innovations, Fujitsu's Lexis (Layer Exchange Interaction Stabiliser), a new magnetic recording medium which reduces thermal decay, hard disks will have to be replaced soon.

Crystal clear

One possibility for archive data is holographic storage where data can be written on to crystals or on to film like photographic film by shining two laser beams at the material, one to carry the data and the other to scramble this data. The information can be written in layers, as for each layer the scrambling laser is positioned at a slightly different angle. There are currently problems with storing the data over long times as the data will start to erode after two years.

Whatever devices we use in the future, one thing is for sure: they will all be part of a huge communications network that should give us more freedom and far more choice. And everything will include a processor, or at least a sensor, from your hand-held to your fridge and even your toothbrush. Ideally, this gadgetry should be easier to use as well, but only time will tell if every appliance in your house will crash regularly because of poor programming.

BT's futurologist, Ian Pearson, gives an amusing and fascination interpretation of how the future will look using all these inventions (see **www.bt.com/innovation/viewpoints/pearson/index.htm**). He predicts that banks as they are today will become more or less redundant in a world where money only exists electronically, that we will all travel in cars designed to communicate with other cars to avoid accidents and to talk to the road to negotiate a gap in the traffic and that finding the right partner will never be a problem with identity badges designed to seek out a compatible partner. Only time will tell which of these predictions will come true, but one thing is for sure – life will never be dull with so much gadgetry to play with. PCP



Hardware problems are responsible for more headbanging than the latest Iron Maiden album. Mike Williams rolls up his sleeves and shows you how to do it yourself

Definitive hardware fix-it guide

Have you bought a new PC or laptop recently? If you did so from a high street store, the chances are you came under serious pressure to purchase an 'extended warranty', where for the bargain price of a few hundred pounds, you get free PC servicing for three years (or four, or five).

This may sound good, but most sales assistants don't rush to remind you that the vast majority of hardware faults occur in the first year of ownership (the first month or two, actually), and the PC already has a warranty for that period. What's more, you'll rarely get anyone to admit an even more important fact: the chances are you can fix the majority of 'hardware faults' entirely on your own.

Most people find this hard to believe, probably because they misunderstand how professional PC technicians actually work. It's easy to imagine them working in laboratories full of expensive test equipment, checking every chip in your system individually, laboriously replacing the faulty one... But the reality is very different.

How they do it?

The real process of fixing a computer is generally very simple, consisting of only three steps: locate the cause of the problem, try some simple generic tips to fix it, and replace the component if the problem persists. No need for expensive equipment (a screwdriver will do, preferably not a magnetised one), or vast amounts of technical knowledge – we'll tell you what you need to know.

Of course, you do also have to keep your own safety in mind, and ensure that you follow proper precautions: turn your PC off and disconnect it from the power before you take off the case, for example. Static electricity in your body can destroy your CPU in a millisecond, so earth yourself before you start by touching a radiator. And two components in particular, your monitor and power supply, retain a charge powerful enough to injure even when your system is turned off, so never mess around with them.

Once you've learned the basic rules, though, everything else is much simpler than you may at first think. Just take your time, look around your system, and you'll soon learn where everything is: memory modules, processor, graphics card, and so on (which will also help when you decide to upgrade your system). But what do you do next?

Tricks of the trade

Some PC problems are straightforward. If Windows reports a problem with your internal modem, and you can no longer use it, and everything else works fine, then it's likely that you've got a modem problem.

But what if your PC just locks up solid sometimes? Or spontaneously reboots? These may often be down to software issues, but it can be difficult to know for sure. This might tempt you to get someone to service the computer, but in all probability, they won't know either.

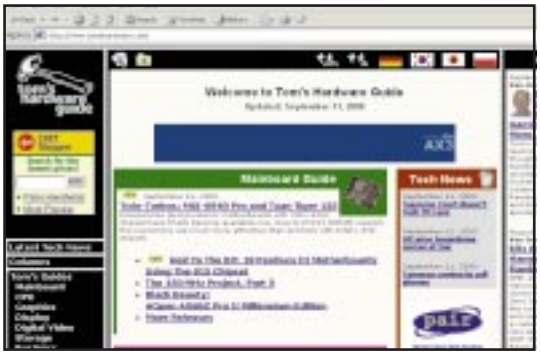
Where professionals do have the edge, is that they understand some of the more likely causes, and have a generic list of tasks to follow that might help solve the problem. Perhaps you've just upgraded your system and so overloaded your power supply, for example, or maybe one of your expansion cards is loose. It's surprising how many problems can be fixed with just a few basic steps, and we're going to tell you exactly what they are.

We all have our limitations, however, and sometimes you might want to admit defeat. That's fine, not even the professionals can fix every problem, and if you're trying to diagnose something potentially dangerous (an electrical problem that keeps blowing fuses, say), then getting help may be a wise move. But most of the time the situation is quite different, so don't rush to get someone else to fix your next hardware problem – you'll probably be able to fix it all on your own. Read on to find the tricks of the trade that can save you time, aggravation and a whole heap of money...

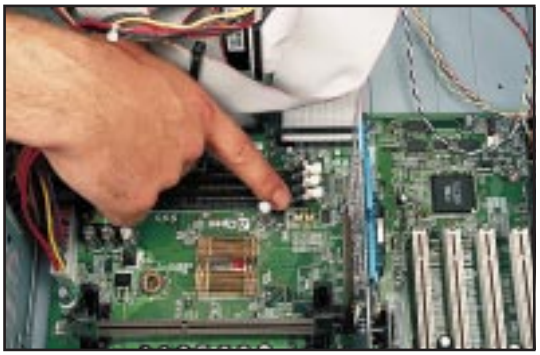
FIX-IT #1

MORE SPEED

1 **Tom's guides on overclocking are well laid out and easy to understand, making it relatively simple for you to get the performance you deserve from your processor. They can also provide you with help on the odd occasion that something goes wrong.**



2 **Jumpers are designed to enable a semi-permanent hardware connection inside your computer. Most motherboards have a printed table next to the jumper plugs explaining which connections do what, but they are quite small and require some dexterity to connect.**



3 **The fan is essential for maintaining a flow of air around the inside of the PC, cooling the components to make them run more efficiently. The heat sink dissipates heat from the CPU, using a series of fins to exchange heat for air, sometimes in conjunction with a built-in fan.**

Tired of your slow PC? Then you might be interested to know that its processor doesn't run at a snail's pace of its own free will. The speed at which the CPU runs in your PC is usually defined by settings in your BIOS, and on your motherboard.

Many people take advantage of this to overclock the processor, running it at a faster speed than it's actually rated. Just by changing some jumpers on your motherboard, or perhaps tweaking some BIOS settings, you can get an instant, free speed boost. At least, that's the theory.

In practice, though, overclocking will probably invalidate your PCs warranty. Setting a processor to run at a faster speed will cause it to produce more heat, perhaps shortening its life unless you install an additional heat sink, or more powerful fan. And then there's the intermittent RAM and expansion card problems you might encounter.

Scary? Yes, it's clear that overclocking definitely isn't for everyone. But if you have an old system you'd like to play with, or just feel brave and are willing to accept the consequences, here's what you need to do.

Begin by rebooting your PC, and starting your BIOS setup program. Check menu areas like CPU Settings or CPU Features for a software option to adjust your CPU clock speed. If you find one, you're in luck; nudge it up a setting, and save your changes (noting the original value).

The alternative approach is to change jumpers on your motherboard to reflect the new speed. This can get confusing, as you'll probably need to tweak settings for bus speed and clock multipliers, too, so working out what is best can be difficult. Your motherboard documentation should help, though, and Internet resources like **http://sysopt.earthweb.com/overc.html** and **www5.tomshardware.com/guides/overclocking/** are also useful.

Once you're done, check that your PC boots up normally. If it doesn't, restore the old values and should things return to normal. Even if it works, though, you should spend plenty of time running your most memory-intensive applications, to confirm that you see no new odd problems. Much better to find the problems now, than when you're doing work for real!

FIX-IT #2

OPTIMISING BIOS SETTINGS

There are lots of options in the average BIOS setup program. Tweak the right ones and you can often speed up your PC considerably – but be careful! It's also possible to slow things down, or stop your system booting up properly at all. Before you make any changes, always note the original BIOS settings, so you can easily restore them if something goes wrong

DRAM read/write burst timing lowest

This setting tells your system how many clock cycles it takes to perform a 'burst' (usually 256-bit) read or write to system memory. Setting this to the lowest figure gives the best performance.

DRAM Refresh type

RAM refresh can occur in two basic ways. RAS Refresh is the simplest and slowest way to do this, but a better choice, if you have it, is CAS-before-RAS (sometimes known as 'Hidden'). This can combine refresh with memory access, for improved efficiency.

DRAM refresh rate

How long does it take to refresh your RAM? If you buy faster memory, you can reduce the time here to speed things up. And you might be able to reduce it a little, anyway, but beware! Any resulting memory errors could be intermittent, and tricky to diagnose.

DRAM refresh queue

All these memory refreshes can hurt system performance. If your RAM supports it, turning on DRAM Refresh Queue enables it to refresh when convenient, rather than immediately on request. It's a worthwhile optimisation, and you should turn this on.

RAS to CAS delay

When you access data in system memory, the RAM chip must first activate the memory bank containing the information, and then send it a read or write command. The delay between these two steps is the RAS to CAS Delay, and low figures are the fastest.

RAS precharge

RAM chips must constantly have their contents refreshed to prevent data being lost. The RAS Precharge figure is one of those that defines how long this process will take. The lowest value offers the best speed.

Read-Around-Write

When your system stores information in memory, it's briefly held in a buffer before being written to RAM. Turn on Read-Around-Write and any requests for that data will go to the buffer, not your RAM, which is significantly faster.

CHIP CREEP

One surprisingly common reason why PCs start misbehaving, is that some of the chips inside have eased out of place. If it's not the day-to-day knocks and jars a system might get, the regular changes in temperature, causing components to expand and contract, can also cause problems eventually. What's more, you may see intermittent symptoms, making them difficult to diagnose, so checking for chip creep is an important task.

It's always important to discharge any static electricity before opening up your PC (touch a radiator, or other earthed object, for example), but this is even more vital when you're handling processors. You need to keep doing this, too, because you may charge up again quite quickly (depending on your clothes and immediate environment). Ideally, equip yourself with antistatic gloves, or an earthing wrist band to make sure this doesn't happen; it's a lot cheaper than paying for replacement components.

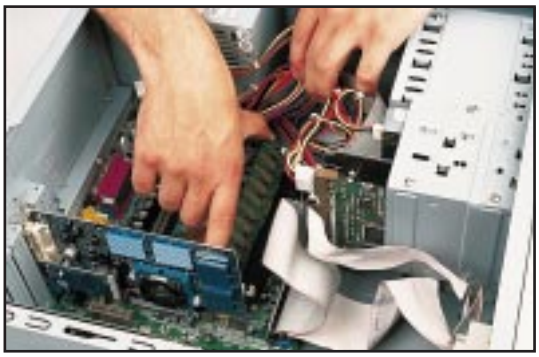
Once you're safely static-free, start by checking your system memory modules. These are small cards, not very high but perhaps half the length of your motherboard, with several RAM chips on them. Gently lift them out of their sockets (older SIMMs will need to be pushed into an angled position first), press each chip firmly into place, then put them back. (Make sure you don't touch the module edge connectors.)

Next, remove your system processor – but don't worry, it's less scary than it sounds. In some motherboards, the processor is kept in a cartridge that can simply be pulled out of its slot. In others, you'll find it in a 'socket'; you'll need to lift a little ZIF (Zero Insertion Force) lever before you can remove it, but then it's just as easy (just don't forget to put the lever back when you're done). As before, handle with care, and don't touch any connectors.

If that doesn't help with your technical difficulties, check all the other chips on your motherboard (and expansion cards), pressing down on each one in turn. It'll take a while, but try it anyway – remove and reseat is a classic technique, used to great effect by all PC technicians.

1 The heat sink makes the CPU easy to spot. Before you can attempt to remove the unit, you should ensure that the locking mechanism has been set to open. You should also touch an earthed object first, to dissipate any static electricity charge you may be carrying.

2 Once the locking mechanism has been released, lift the unit out of the machine vertically. Due to the nature of the connectors, a steady pressure is advisable. Although the connection may be stiff, avoid violent wrenching, as this may damage the pins.



3 Installing RAM is usually a quick and easy operation. Modern SDRAM just clips straight in, but older SIMM's (Single In line Memory Modules) must be inserted at an angle. Just line up the pins with the connectors, give it a gentle push and it's in.

BEEP CODES

Each time you turn on your PC, it performs a series of basic checks on your PC hardware (everything from memory and hard disk, to keyboard and display), in what is normally called the Power On Self Test (POST). Once the test is complete, you'll usually hear one or more beeps to tell you the result – but what do they mean?

The exact interpretation of beep codes varies according to your BIOS manufacturer, unfortunately, but there are some general rules. In particular, you should always hear a single beep that tells you the POST has been completed successfully. If you don't, and there's nothing appearing on the screen, check that your system is turned on and connected to a power socket (swap power cables, too). It's also possible that the PC's power supply has failed, so replace that next.

The latest Award BIOS uses just one beep code (a single long beep, then two short beeps) to indicate that you have a video problem. Remove your video card, gently push the chips into place, then reseat it and try booting again.

A Phoenix BIOS is much more complex, however, typically using three sets of beeps separated by pauses. There are lots of different codes that might occur, but they do fit into convenient groups.

A code that begins with a single beep generally means the motherboard needs replacing, while codes starting with two beeps suggest a RAM problem. Hearing a 3-2-4 sequence indicates a keyboard controller failure (try a new keyboard and see what happens), while a 3-3-1 or 3-3-2 code indicates a problem with CMOS RAM. Replace the battery, if possible.

If your system doesn't have documentation on the beep codes it uses, it's a good idea to locate it on the Internet so you have the information when you need it. Even when you've figured out what a code means, though, don't take the interpretation too literally – it may not always be correct.

If your system won't boot up, it's always worth removing all non-system critical cards, reseating the rest, checking that all the chips on the motherboard are firmly in place, and internal cables are properly connected. (Be careful, though – mishandle your processor or RAM modules, and you could make the system worse than it was to begin with).

Comprehensive lists of beep codes can be found at **www.ami.com/amibios/support/beepcodes.html** for AMI and at **www.phoenix.com/pcuser/bio.html#q3.5** for Phoenix and Award.

FIX-IT #5

HEARING DIFFICULTIES

1 When installing a sound card, it is essential to remember to connect it to your CD drive, using the sound card audio cable. This will not only increase the quality of your sound out put, but enable you to record audio CD's directly on to the hard drive.

2 To connect the cable to your CD drive, remove the drive from its bay through the front of the machine, feed the cable through the gap left by the drive, connect the cable to the jumper pins, and then re-insert the drive, making sure the cable is all on the inside of the computer.

3 Thread the cable through to your sound card, and plug it into the CD In connector to finish the job. Depending on the internal arrangement of your PC, you may find it easier to remove the sound card first, so as to see the connections better.

Whether pumping out the soundtrack of your latest game, playing an audio CD or providing a games port for your joystick, the typical sound card generally performs so well it's easy to forget exactly how many functions it performs. There are occasional problems, though, so it's handy to have a few strategies to cope.

One of the most common issues is discovering that, while all other sounds play correctly, you can't hear audio CDs. Open up your PC and check that there are three cables connected to the back of your CD drive. These will include a ribbon connector for data transfer, a power cable with a chunky four-pole connector, and most importantly, a thin cable that runs to the CD In socket on your sound card. You won't hear audio CDs unless that's connected, so check it carefully.

Some people report a more serious problem, where their PC just locks up when they try to play an audio CD. This might occur if the CD drive is conflicting with some other device, but sometimes changing the drive settings is all you need to do. Select Control Panel ‹ System › Device Manager, find and click on your CD-ROM drive, then select Properties › Settings. Clear everything in the Options box, click on OK to close all open dialog boxes, and try again.

A poorly-behaved graphics driver can also cause sound problems, particularly in games. Try turning down graphics acceleration at Control Panel › System › Performance › Graphics (or look for an updated graphics driver on the manufacturers Web site). While this may work as a 'quick fix', it can sometimes stop other games working properly, so keep that in mind if you encounter difficulties elsewhere.

Most important of all, don't rule out the obvious! If you're not hearing any sound at all, the most likely explanation is the simplest – your speaker volume has been turned down on the PC, someone's accidentally hit the Mute button on your speaker, or something similar. Make sure you check the basics before you start tinkering with software settings.

FIX-IT #6

POWER CONCERNS

Erratic memory problems; a system that won't boot up; a poorly-performing hard disk, and corrupted data: four very different symptoms, all of which might be caused by a fault with your power supply.

The most common power problem is, of course, not having any at all, leading to the traditional troubleshooting section in the manual:

Problem: Computer doesn't boot up
Resolution: Switch it on

Usually it really is that simple (though plugging in the power cable, switching on power at the wall, and occasionally changing the cable for another one if the fuse has gone may also help). It could be a power supply problem too, though.

If the unit has failed completely then there's nothing you can do but replace it (though fortunately, that's not too expensive). Never, ever try to take the cover off and poke around inside – those stickers marked 'danger' and 'no user serviceable components' are there for a reason. Even when the system is unplugged, the power supply may hold enough charge to injure you.

There may, on the other hand, be a fuse at the back of the power supply, which you can replace. If your system then boots up, so much the better, but if the electrical problem is elsewhere then you may find the fuse keeps blowing. This could be dangerous, so calling in professional assistance is probably best.

Things get more complicated if you have intermittent problems. One cause for this is overloading the power supply with too many demands; what, you thought you could just add new devices to your PC indefinitely? Add a card or new drive, replace your processor, all these things will increase the power your system needs. If the total load begins to exceed the rated capacity of your power supply (see the table for guidance), your PC may begin to fail. Keep track of the current power demands every time you perform an upgrade, and get a higher-rated power supply if it becomes necessary.

COMPONENT	WATTS USED
Pentium CPU	20
Pentium II, III CPU	30
Motherboard	20
64MB RAM	5
2D graphics card	5
3D graphics card with 8MB or more	20
Sound card	7
Additional PCI card	5
Floppy drive	5
Hard drive	25
CD/DVD drive	25

FIX-IT #7

CHANNEL HOPPING

Have you added a new drive to your system recently? PCs are expandable, allowing you to have perhaps two hard disks, a DVD drive and CD writer all installed at the same time – but that doesn't mean they'll necessarily work together in perfect harmony. Make a mistake during installation and you could find your hard disk slows down, or your CD writer becomes less reliable, so it's worth checking to make sure you've got everything right.

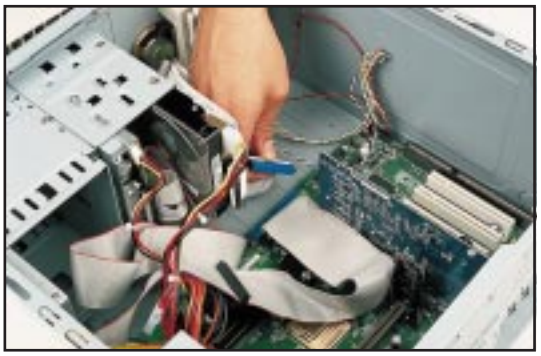
Standard PCs are equipped with two EIDE controllers, each capable of supporting two drives. The catch is that each controller can only transmit information to and from one drive at a time. So, if your CD writer and hard drive are connected to the same controller, they'll constantly be competing for time. Result: reduced performance, and probably lots of trashed CDs. Not A Good Thing.

It may not be possible to solve the problem – if you have more than two drives, compromise is inevitable – but you can make things better. The key is to make sure the drives where performance is most critical, are connected to different controllers. This might be two hard drives, or your primary hard drive and a CD writer, for example.

In addition, when you have two drives on a single EIDE controller, you need to tell the system which device gets the highest priority when it comes to data transfer (the Master), and which one has to wait (the Slave). This is normally done by setting jumpers on the back of the device at installation time, but if you're having performance problems it's worth checking you've got everything right. Here's a typical solution.

This isn't ideal, as your CD-ROM performance will now be reduced. But on the other hand, your CD writer should work much more reliably as the master device, or if you had a DVD drive, you'd get much better performance out of it when watching movies. It's worth experimenting, to make sure you get this right.

IDE Primary Master	Hard disk
IDE Primary Slave	Original CD-ROM
IDE Secondary Master	New CD-RW or DVD-ROM
IDE Secondary Slave	Anything you like



1 The Enhanced Integrated Device Electronics cables, shortened to EIDE, are integral for allowing your hardware to communicate. Follow the ribbon connectors through your computer to find out which devices they are attached to.

2 The Master/Slave setup of EIDE controllers enables you to expand on the equipment inside your PC. To avoid conflicts, check the jumpers on each drive to ensure that the Master/Slave settings are correct.

3 If you want optimal performance from your drives, you could try different EIDE configurations to see what runs best. Use BIOS to make sure that all EIDE channels have been enabled, or the computer will not recognise the device.

FIX-IT #8

PARALLEL PROBLEMS

It used to be that the parallel port was the simplest device on a PC; just connect your printer, and forget it, because what can possibly go wrong? Unfortunately there's now rather more scope for problems, from performance issues with your printer, to finding that a parallel port scanner isn't recognised at all. Whatever your difficulty, the answer is likely to be closer than you think

When you're adding multiple devices to the same port, a ZIP drive, and a printer connected to that, say – then this should be the first thing you check. Not all devices work properly when sharing the parallel port with something else, so disconnect everything else apart from the misbehaving peripheral, and see if that helps. Checking the manufacturer's Internet support pages for assistance may be useful, too.

Next, take a look at any settings in your BIOS setup program that relate to the parallel port. If you're looking to improve performance (both on speed and reliability), then check that the port is set to ECP/EPP mode (or ECP+EPP, or just ECP – it varies according to your BIOS) – this is as fast and flexible as you're likely to get.

On the other hand, if you can't get a parallel port device like a scanner to be recognised, or are having other intermittent problems, try selecting SPP (Simple Parallel Port) or Compatibility mode. The performance won't be great, but there's much more chance of the device actually working.

As usual, it's worth checking with the Windows Device Manager for possible conflicts. Select Control Panel › System, click on the Device Manager tab, then find and double-click on Ports. Select Printer port, then Properties, and look for any problems listed in Device Status, or conflicting devices listed under the Resources tab - if they're there, they'll be obvious.

Finally, make sure you've checked the basics. Check that the driver you have for your device is up-to-date, for example, by going to the manufacturer's Web site and comparing the version number with the one you have on your PC. If you're not sure you have the latest, download and install them anyway - it's better to be safe than sorry.

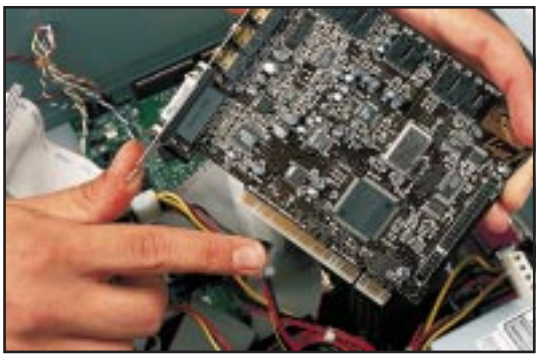
On the hardware side, consider trying a new printer cable. Old ones may not have all the wires connected that you require, or might be too long for the parallel port mode you want to use. This is not a particularly common problem but is certainly worth trying first if you have a spare printer cable lying around the house.

FIX-IT #9

CLEANING UP

1 PCI based cards really are the business. Just slot them in, install your drivers, and away you go! And you can have as many as you can cram into your PC, fulfilling roles from audio management and graphics acceleration through to improved communications and networking.

2 Removing a PCI card is remarkably simple, just undo the screw, and lift the card out of its slot, taking care not to damage the connectors. Multiple cards can sometimes cause a conflict when booting up. If so, put them in one at a time to see which work.



3 It is vital that the connectors are clean and undamaged, otherwise you will experience problems when trying to use the card. Do not touch them with your fingers, but use a clean dry cloth to remove any foreign objects from the surface of the connectors.

When you turn on your PC, your BIOS searches for ROMs belonging to other cards installed in your system. When it finds one (a graphics card, for example), the BIOS passes control to it, so that the card can initialise itself correctly. Normally this works just fine – unless there's a problem with the card, in which case your system will probably just freeze when you turn it on.

One simple reason for this could just be that the card is no longer seated correctly. Turn off your PC and disconnect it from the power, then remove each card in turn. Taking care to hold it lightly by the edges only, gently blow off any dust that might have gathered on the card, and clean the card connectors using a soft cloth. It's also worth pushing any chips on the card gently into place, to make sure they are seated correctly.

Once the cleaning is complete, reseat the card back in its slot. Ensure it's making a firm connection, then screw the cover firmly into place to make sure it stays there. And if you're short of screws, perhaps through losing one the last time you installed a card, then go and buy some more! Buy some anyway – they only cost a few pence, a bargain when you consider the hassle a loose card can cause.

If all the dusting and polishing has no effect whatsoever, don't give up! It could be there's a more serious problem with the card altogether, so try removing all but the most vital (you'll need your display card, obviously). If your system reboots now, restore the other cards one by one until you find the culprit.

Once you know which card is causing the problem, it's sometimes possible to resolve it simply by installing it in a different PCI slot. Some motherboards, for example, allocate the same IRQ to your AGP graphics card, and to whatever is in the nearest PCI slot. Sounds stupid? Yes, we think so too, but it's worth bearing in mind. Try leaving the PCI slot nearest your AGP connector free, if possible, or simply switch the cards to different slots and try another reboot.

FIX-IT #10

AND THE PASSWORD IS?

Most people are concerned about their PC's security, so discovering that their PC or laptop has a password feature in the BIOS can initially seem very attractive. Forget what the password is, though, and you may be less impressed – but what can you do?

If the password stops you starting the system, then you have only a few choices. If you're lucky, your motherboard will provide a jumper option that resets the password (look in the manual supplied with your computer or phone your manufacturer's technical support line to find out which jumper) and allows you to access the PC again. Easy. Hooray!

The less fortunate will have to remove the CMOS battery – it looks just like a giant digital watch battery – leaving it out until the data is erased. We've seen reports that this can take anything from 'ten seconds' to 'two days', so patience could well be necessary. Don't try and speed things up by short-circuiting the leads of the battery, as this could leave you with even worse problems!

Eventually, the password will finally be lost. The down side is that all your other CMOS data will disappear, too, which will be annoying if you've spent time optimising them for your requirements, so writing down your BIOS settings right now, while you've got the chance, is not a bad idea at all..

Another option, somewhat alarmingly, may be to call your computer manufacturer and ask them. It is claimed that some systems have 'back door' passwords that always work, to help people who have forgotten their own password. This is convenient when you've forgotten your password but hardly a boost to security. Especially if some Phoenix systems really can be accessed by using the not-too-difficult password of 'phoenix'. Find out more at sites like PWCrack.

www.pwcrack.com/BIOS/bios.html

If you can still start your system, then you can try any of a selection of utilities designed to recover or change an existing password. We like !Bios (**www.11a.nu/ibios.htm**), which works with nearly everything and CmosPwd (DOS, Windows 9x, NT and Linux versions available from **www.esiea.fr/public_html/Christophe.GRENIER**).

If you don't like those, try an Internet library like Tucows (**www.tucows.com**) or SoftSeek (**www.softseek.com**), or enter keywords like BIOS PASSWORD or BIOS CRACK at your favourite search engine, and see what comes up.

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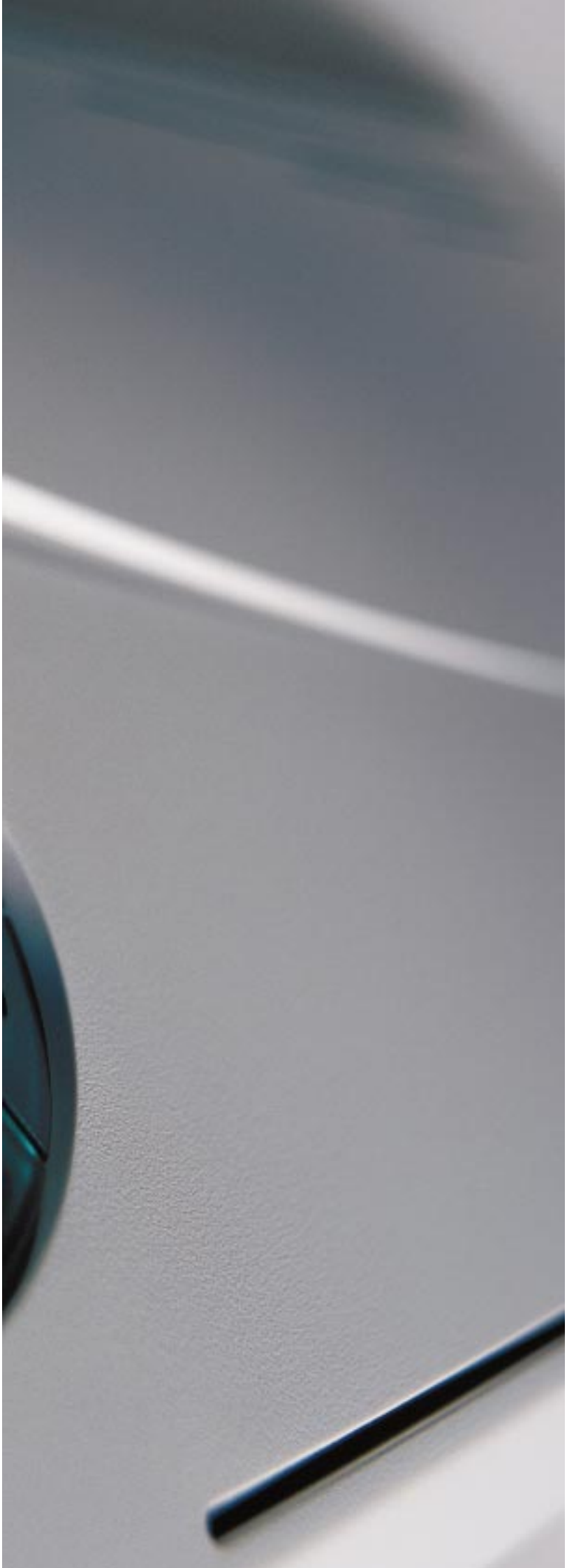


£799 scorchers

Mid-range PCs now cost well under £1,000 and for £799 all-in you can pick up a high performing, general-purpose system for home or small business. Simon Williams holds the starting pistol

With around £799 in your pocket you can buy a number of things, from a second-hand Vauxhall Astra to a fortnight in Alicante. If you decide to blow it on a new PC (less exciting, but longer-lasting than either of the first two), you may be surprised at what you can get for your money.

Components continue to increase in value, whether it's more megabytes of memory, more gigabytes of hard drive space, more megahertz in your processor or more inches on your monitor screen. The hardware gets more capable by the month and £799 will buy you close to the ideal general-purpose PC.

So what's a general-purpose PC? One that can certainly run any everyday application, from word processing to desktop publishing, from spreadsheet to accounts, from address book to stock control. These days, it should be able to conduct itself well on the Web, too, with the processing power to handle streamed video and before long 3D shopping, too.

There are now four ways of putting together an effective mid-range PC. They're called Pentium III, Athlon, Celeron and Duron. The suppliers in this group test haven't reached a consensus over the best way to go and there are systems reviewed here based on all four processors.

Preconceived ideas of which will run the fastest aren't always accurate, either, as the fixed budget dictates that the more expensive processors may have to be at lower clock-rates. The set-up of specific systems can have a key effect, too. Here there's a 700MHz Duron beating a Pentium III 700. There's a 600MHz Celeron knocking the socks of a Duron 650, only to donate them to another machine with an identical processor at its heart.

So, a more varied group this month, which makes for more fun in the reviewing and more choice for you.

Graphics choices

There are two processors in a typical PC: the central processor – Pentium, Athlon or whatever – and the graphics chip. The graphics chip can be doing nearly as much work in its own sphere as the central processor does and choosing the right graphics adapt can be even more important to the overall performance.

There are several classes of graphics chip in this group, ranging from the circuitry built into Intel's 810 and 815 chipsets at the bottom end, through mid-range processors like 3dfx's Voodoo3 chip and nVidia's Riva TNT2 up to the GeForce2MX, the fastest graphics processor in this group.

Most of these chips are measured on their 3D performance rather than what they can do with 2D images. It's the 3D performance which determines how good they are at games, while 2D acumen is more important for video or TV playback. You can see this by comparing the results for the Video 2000 and 3DMark 2000 benchmarks.

As the names suggest, a high score on Video 2000 indicates a machine which should be good for playing back DVD movies. The 3DMark result is more important in a machine which will be required to run Quake III Arena or Unreal Tournament.

What to look for

The most important parts of your new PC

1

2

3

4

1 HARD DRIVE
In this price bracket you really should be seeing a hard drive with a capacity of at least 15GB. Most suppliers are now including 18-20GB as standard, as minimum prices tend to stay locked at £100 – it's the capacity that increases. Check the drive uses the faster UDMA66 protocol.

2 MEMORY
You should be offered at least 64MB of memory in a mid-range machine like this. 64MB is sufficient for Windows 98SE and ME, but you will notice a performance improvement with 128MB – specifically, fewer disk accesses. 128MB will also provide a degree of future proofing to your system.

3 PROCESSOR
For £799 you can expect any of the four main PC processors available from AMD and Intel. You should be getting a clock rate of over 600MHz when paying this much and although the difference in real performance won't be that noticeable, Windows Me is happier with a faster chip.

4 MONITOR
There's little point in paying for a fast graphics card if you don't have a decent monitor to display the picture on. It's hard to select a good monitor without seeing its display – specifications like dot-pitch only give a rough guide. A Trinitron-based monitor will nearly always give a better picture.

Buying advice

What you should look for when choosing your PC

What you can fairly expect for your £799

If you're a first time buyer or are not particularly technically minded, you may not know what your budget should be able to buy you at the moment. Good job you bought **PC Plus** before taking the plunge, then, as I can tell you what it's reasonable to expect and what is not going to happen in terms of your new PC's specification.

Let's take the basic spec, which you should expect from any manufacture worth dealing with. You should look for:

- A processor of at least 600MHz
- At least 64MB of memory
- A hard drive of between 15GB and 20GB
- A graphics adaptor with 32MB of dedicated memory
- A 17-inch monitor with a nearly flat tube face
- A DVD or CD-RW drive
- Comfortable keyboard and mouse
- Some application software
- A warranty with at least one year on-site or two years, back to base cover

Taking each of these items in turn and starting with the processor, Intel's premium chip is the Pentium III, with its budget cousin, the Celeron, offering less performance, but not much less. The same is true of the difference between AMD's Athlon (premium chip) and its newly introduced Duron. If performance is particularly important to you, go for a Pentium III or Athlon.

Memory is always useful and you shouldn't find it too difficult to get 128MB fitted to a machine at this price point. Windows 98SE and ME will both run adequately with 64MB, but you will notice an increase in the amount of (slow) disk work your PC does. To be honest, you'll be hard pressed to use 15GB of space on a hard drive, so you'd be better off pushing for more memory than a higher capacity hard drive.

If you're a Quake, Unreal or Tomb Raider fan, the graphics adaptor should be as important to you as the main processor. If anything, take a slower processor if you can persuade your supplier to include a GeForce or GeForce 2 graphics adaptor, instead. These graphics chips do so much work, you'll hardly notice the difference in processor power.

Other hardware items are all negotiable. Aim for the best mix you can and bear in mind your specific requirements. For example, if you have application software you can bring with you to your new machine, there's less reason to look for a PC with applications pre-installed.

What you may expect, but won't get

There are still things that can be improved on a PC at this price point. If you see any of the following in a system, it will usually be at the cost of some other component.

Twin DVD and CD-RW drives or a combination of the two functions in one drive. These combo drives are still expensive – around £150 retail – so you would have to lose something else if you insist on one being fitted.

Back-up storage, like a Zip or Superdisk drive. The Systemax machine included a Zip 100, which is commendable, but at the cost of a slower processor (and a badly set up one), 64MB rather than 128MB of memory and a lower capacity hard drive.

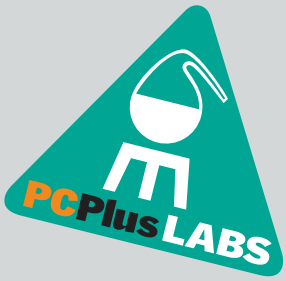
A full nVidia GeForce2 GTS graphics adaptor. You needn't worry too much about this, though, as the newly released budget GeForce2 MX card offers 80 per cent of the GTS's performance at around half its price. It's a very shrewd move of nVidia's to introduce this budget card, as it mops up an area of sales which had previously gone to its rivals, such as 3dfx.

Where to buy

When you come to buy your computer, there are two basic options: the high street and mail order. If you go along to a shop, you'll be able to touch and feel your PC before you buy it. This can be a more reassuring way to buy but the bargains are most often to be found in the world of mail order. And as long as you pay by credit card, you have the peace of mind of being covered against fraud. The cases of people suffering at the hands of mail order companies are the exception, rather than the rule. Check our **Campaign** section regularly for repeat offenders. The real advantage of direct buying is that you can specify exactly the system you want, rather than having to buy one off the shelf.

Plain English glossary

Confused by the jargon? Help is at hand...



AGP SLOT
An internal slot in your computer that provides a faster path for data. Graphics cards using an AGP slot will usually perform better than similar cards in PCI slots.

CD-RW DRIVE
A drive that is able to read CDs and write information to CD-Rs (CDs that can be written to once only) and CD-RWs (CDs that can be reused like a floppy disc).

CHIPSET
A chipset provides the basic or core functionality of a device. They can be found in sound cards, graphics cards and just about every other piece of computer hardware.

DVD DRIVE
A DVD drive is able to read the latest high-capacity DVD discs, as well as CDs. With appropriate decoder software or hardware, you can watch DVD movies on your PC.

GB OR GIGABYTE
A measure of a storage area (or memory) within the PC. One GB is equivalent to 1000MB.

HARD DISK OR DRIVE
A device inside your computer where you store all the information you want to keep permanently, even when the machine is switched off.

INK-JET
A type of printer that squirts a tiny jet of ink on to the printer. They are particularly well suited to home and small office applications.

ISA SLOTS
An old method of adding internal cards with extra features to your PC. Many new computers have no ISA slots.

MB OR MEGABYTE
A measure of a storage area (or memory) within the PC. Equivalent to 1000 bytes, a basic unit of storage.

MHZ
This measures the speed of a PC.

MODEM
The device that connects your PC to the Internet. Most new computers come with them as standard. Make sure yours is V90 compliant.

MOTHERBOARD
See system board.

PCI SLOTS
These allow you to plug in expansion boards with extra features inside your PC. Typically, modern sound cards and modems are fitted to PCI slots.

PROCESSOR
The engine at the heart of your PC. Speed is measured in MHz – the faster the better.

RESOLUTION
Basically, this reflects the amount of information you can see on your screen. The higher the resolution, the more you can see, by making everything smaller.

SUPERDISK DRIVE
Reads and writes information to special 100MB discs. Can also read and write to normal floppy discs.

SYSTEM BOARD
The panel inside your PC, into which everything else is plugged, including power, processor, memory and graphics card.

ULTRA DMA 66 AND 100
An agreed standard, used to link the hard drive to the computer. Ultra DMA 100 – the fastest available today.

USB
Short for Universal Serial Bus, it is an easy-to-use standard for connection peripherals, such as printers and scanners, to your computer.

V90
This is simply the fastest agreed standard for modems over a normal telephone line. If you buy a modem, make sure it is V90 compliant.

ZIP DRIVE
Iomega's Zip drive has been around for donkey's years. It can read and write information to special discs and is available in 100MB and 250MB versions.

Atlas Meridian A700PL

PRICE £800 **EX VAT** £681 **SUPPLIER** Atlas Technologies
PHONE 07000 285275 **ONLINE** www.atlasplc.com

Atlas squeezes a 700MHz Athlon processor into its Meridian A700PL, which gives it extra performance

What you get

The Meridian A700PL is a very good start to the group. Its midi tower case sports an 8-speed DVD drive in the top drive bay and a standard floppy below that and is matched inside by a 19GB Fujitsu hard drive. The processor is a 700MHz Athlon, which still knocks the pacey Durons into the shade, and is supported by 128MB of memory.

There are only three PCI expansion slots on the Gigabyte MicroATX system board, which could be restrictive, but all are vacant, as the main board supplies sound and modem facilities.

Atlas uses a Creative Riva TNT2 graphics card, which runs into a fairly good CTX monitor, with none of the mesh-effect seen on some others. The tube face is slightly curved, but nothing too worrying. Controls are easy to use.

In use

The best thing about the Meridian is its SYSmark result. A **PC Plus** Index of 1.57 is considerably better than any of the others and shows the extra performance you can still get out of an Athlon.

The Video 2000 benchmark returned the best result in the group, too, with an index of over 2,400. 3DMark results were less impressive, as the Riva TNT2 is last year's graphics card, but at around 1,400 are still useful.

The machine is fairly comfortable to use, with an Acer keyboard and Logitech mouse combination, though the key feel could be better. A copy of SmartSuite Millennium is included with the machine.

PCPlus BENCHMARK 1.57

Service and support

Atlas offers a basic one year, back to base warranty, about the least they can get away with. Other service options, including on-site maintenance, are available at extra cost.

Conclusion

This is a well made and fast machine – indeed the fastest we tested in this group by a good margin. If you want that extra bit of performance, while not sacrificing other aspects of the system, the Meridian A700PL is a very good choice.

PCPlus Verdict

ATLAS MERIDIAN A700PL

✓FOR	✗ AGAINST
→ Excellent performance	→ Limited expansion potential
→ Athlon processor	
→ 128MB memory	

Specifications	8
Quality	9
Value	9
Performance	10
OVERALL	**9**

Big Red Voyager

PRICE £800 **EX VAT** £681 **SUPPLIER** Big Red
PHONE 08700 711117 **ONLINE** www.bigred.co.uk

Big Red's Voyager is quick and looks good. A 700MHz Duron and 128MB memory do that for you

What you get

Big Red's take on an £800 home and home office PC makes some good hardware choices. The midi tower case holds an eight-speed Samsung DVD drive as well as a conventional 3.5-inch floppy drive.

Inside, the FIC system board is designed for socket A and holds a top of the range 700MHz Duron processor. Big Red has managed to squeeze in 128MB of memory, too. It runs at 100MHz and it's interesting to compare this solution with Carrera's, which pairs its Duron 700 with 64MB of faster 133MHz DIMMs.

Sound comes from the VIA chipset and runs to a pair of Diamond Audio speakers, which are of similar quality to Altec Lansing's ACS22s. There's a V90 modem in one of four PCI slots and video is handled by a 16MB Voodoo3 3000 card.

The video signal runs to a 17-inch Lite-On monitor, which may not be a well known brand, but gives a good, stable picture on a reasonably flat-faced tube.

In use

The Big Red PC is a good performer, with a **PC Plus** Index of 1.37 comparing well with the Durons from last month's group and looking impressive against the rest of this group, too. 3DMark results were also acceptable, though the Voodoo3 card doesn't have to work as hard with its 16-bit colour palettes to achieve its frame rates.

The system wouldn't complete the Video 2000 benchmark, freezing each time it came to the interlaced display, flicker test. The machine showed no other signs of instability, though.

PCPlus BENCHMARK 1.37

Service and Support

Big Red offers a one year back to base, parts and labour warranty, on to which it adds lifetime labour cover. So, after the first year, you still only have to pay for parts that need replacing.

Conclusion

Big Red's Voyager is a well thought out system, which offers out of the ordinary performance from a good combination of components. Although some parts are from lesser known suppliers – the keyboard and mouse for instance – this doesn't disturb the overall value of the system.

PCPlus Verdict

BIG RED VOYAGER

✓FOR	✗ AGAINST
→ 700MHz Duron	→ No bundled application software
→ 128MB memory	
→ Above average speakers	

Specifications	8
Quality	8
Value	9
Performance	8
OVERALL	**8**

Carrera Octan DM700

PRICE £799 **EX VAT** £680 **SUPPLIER** Carrera Technology
PHONE 020 8307 2800 **ONLINE** www.carrera.co.uk

Not up to the usual value of Carrera, the Octan DM700 is slow for a 700MHz Duron and lacks expandability

What you get

Carrera uses a mini-tower case on its Octan DM700 machine, which has room for just three drives. In this configuration, there's a 10-speed Panasonic DVD drive and a standard 3.5-inch floppy installed. Permanent storage comes from a 14.2Gb Fujitsu hard drive, providing a well-matched storage regime.

The processor is another 700MHz Duron, though supplied with 64MB of 133MHz memory. The Abit system board is FlexATX, with just two PCI expansion slots. This leaves little scope for expansion, even with sound and modem on-board already. The VIA PCI audio drives a pair of Altec Lansing ACS22s, which are above average for a budget sound system.

Graphics output comes from a 64MB nVidia Riva TNT2 chip, running into an LG Studioworks 775C monitor. This unit is a staple of Carrera's product range and produces a clean, well-defined picture.

In use

Performance results from the Octan weren't as good as from similar 700MHz Durons. The **PC Plus** Index was only 1.07, nearly 30 per cent lower than from Big Red's Voyager, for instance. 3DMark returned lower than expected figures, too, coming it at only around 1,400 at both resolutions. It did complete the Video 2000 benchmark with a bit more aplomb, scoring 2,282 overall.

The machine is easy to use, with excellent Key Tronics keyboard and Microsoft Intellimouse combination. The machine comes with Windows Me, so the advantages of the new operating system are available to you.

PCPlus BENCHMARK 1.07

Service and support

Carrera offers an above average two year, on-site warranty with the Octan, so you have less to worry about in case of component failure. The call-out is two working days, which is less comforting.

Conclusion

Carrera needs to look at the set-up of this machine, as we believe there's a good deal more performance available from the chosen processor and graphics card. While the machine is well built and the video side provides a bright and stable picture, there's better value to be had.

PCPlus Verdict

CARRERA OCTAN DM700

✓FOR	✗ AGAINST
→ Sharp, high contrast monitor	→ Under-performing Duron set-up
→ Good keyboard/mouse combo	→ Little expansion from MicroATX board
→ Windows Me	

Specifications	8
Quality	8
Value	6
Performance	6
OVERALL	**7**

Gateway Essential 600C

PRICE £821 **EX VAT** £699 **SUPPLIER** Gateway
PHONE 0800 142000 **ONLINE** www.gateway.com/uk

Gateway's Essential crams everything into a small case, but suffers on performance as a consequence

What you get

Gateway's new Essential 600C is what's generally described as a book PC. This means it's smaller than most, but also less well equipped. It has a 48-speed LG CD-ROM and a floppy drive on the front panel and a 14.3GB hard drive inside, but there's no room to add anything else.

The 600MHz Celeron doesn't really hack it in this company, though it is backed by 128MB of memory on the Intel FlexATX system board. There are two PCI expansion slots, but no serial or parallel ports. Everything has to be plugged into one of five USB sockets – four actually, as the keyboard and mouse are USB and use one of them.

Graphics are left to the 810E chipset and runs to a Gateway EV700 monitor, which gives a fair picture.

In use

Performance was pretty miserable, even by Celeron 600 standards. SYSmark 2000 produced a **PC Plus** Index of just 1.03 – I've seen a 566 Celeron beat this by nearly 10 per cent. The Intel 810 chipset kept the 3DMark results low, too, scoring under 900 on the high resolution run and 1,322 at the lower resolution, even though it only runs with a 16-bit colour palette.

The keyboard and mouse combination is reasonably comfortable to use, with the same mouse that Mesh used to supply, which it called a Web Cruiser.

Service and support

Gateway provides good warranty with the Essential, covering the first year on-site and adding in two years back to base on top of this. As is normal with Gateway, though, the company decides when the machine is in need of a call-out or return shipping.

PCPlus BENCHMARK 1.03

Conclusion

This is a novel machine, but its size acts against its functionality. If you want a basic PC to run standard business applications, you may find its compact size a real advantage. If you want a machine that can grow with you, however, you might find the Essential 600C limiting.

PCPlus Verdict

GATEWAY ESSENTIAL 600C

✓FOR	✗ AGAINST
→ Very small desktop footprint	→ No serial/parallel sockets
	→ Poor performance
	→ Expansion only through USB

Specifications	7
Quality	8
Value	7
Performance	6
OVERALL	**7**

Mesh Matrix 700D

PRICE £799 **EX VAT** £680 **SUPPLIER** Mesh Computers
PHONE 0208 208 4705 **ONLINE** www.meshplc.co.uk

Mesh has pulled all the right stops out with the Matrix 700D, which is great on value and performance

What you get

Mesh has gone one better than most in virtually every area of this machine. It starts with a good big case, with room for six drive bays and a 16-speed Pioneer DVD and floppy fitted in two of them.

Inside is a 19GB hard drive and the processor is a 700MHz Athlon, rather than the more common Durons. This is backed by 128MB of memory in an Asus system board, with a pair of ATA100 drive controllers, as well as twin ATA66 ones. The system can support up to eight IDE drives.

There are five USB ports and five PCI slots, with two occupied by a Creative SoundBlaster card and a Diamond SupraExpress V90 modem.

Mesh fits an ATI Xpert 2000 graphics adaptor, complete with cables for video input and TV output. The system includes a 17-inch Hansol monitor with a fairly flat display, though the shadow-mask creates a slight chicken-wire effect across it.

In use

The machine ran fast, with a **PC Plus** Index just a nose behind the Big Red machine, at 1.36. The 3DMark test was not so hot, as the ATI card isn't one of the latest generations of 3D adaptors. Even so, it managed over 1,450 at both resolutions and added a good Video 2000 result of 2,225.

The Microsoft keyboard and mouse combination is easy to work with, though the key feel on the Internet keyboard isn't as a good as from, say, a Key Tronics device.

PCPlus BENCHMARK 1.36

Service and support

Mesh offers a one year, on-site warranty with the Matrix, followed by two more years back to base, including both parts and labour. This is better than most PC warranties in this price bracket, but the on-site call-out depends on the time it takes Mesh to source spares.

Conclusion

As a mid range home or home office system, there's little that can be levelled against the Matrix 700D. Soundly constructed with attention in all the right areas, the main system box includes a fast modern processor, lots of memory, more than ample hard drive space and a fast DVD drive. For general family duties, this is excellent value in a performance PC.

PCPlus Verdict

MESH MATRIX 700D

✓FOR	✗ AGAINST
→ Athlon processor	→ Speakers not wonderful
→ 128MB memory	→ Graphics card not hot on 3D
→ 19GB hard drive	
→ Good software bundle	

Specifications	10
Quality	8
Value	10
Performance	9
OVERALL	**10**

NEC Direct Direction Sm650AD

PRICE £799 **EX VAT** £680 **SUPPLIER** NEC Direct
PHONE 0870 333 6329 **ONLINE** www.nec-online.co.uk

NEC Direct has put together a good system. With a 700MHz processor it would have won the lot

What you get

NEC has put together a neat machine in one of its versatile midi tower cases. If you decide you want a desktop instead, you simply open the case, remove the drive cage, turn it through 90° and you have a desktop machine – a great way of spending a Sunday afternoon.

NEC decided to include a CD-RW rather than a DVD drive, and we have no argument with this. It partnered it with a 19GB Maxtor hard drive and a standard floppy, but chose to include a 650MHz Duron, where most were 700s. It also supplied 64MB of memory, which is adequate but a minority choice.

The 17-inch monitor is an NEC VR17 which gives a clear, sharp picture, although the tube face isn't that flat. It runs with a GeForce2 MX graphics adaptor, the highest performance 3D card in the group.

In use

The NEC machine performed reasonably, though not as well as the Big Red and the Mesh on the SYSmark benchmark. This is largely a result of using the 650MHz version of the Duron processor, rather than the current top clock rate of 700MHz.

Where the Direction did much better, though, was in the 3DMark tests. The GeForce2 MX card returned indexes of 3,510 and 3,727 for the low and high resolutions runs. The Video 2000 test didn't do as well as some others, as the GeForce is primarily a 3D card.

Keyboard and mouse are both good quality, though the key feel is a little harsh.

PCPlus BENCHMARK 1.20

Service and support

NEC Direct offers a one year on-site warranty with the Direction Sm650AD. This is better than a standard back to base warranty, as the waiting time should be reduced and you don't have to worry about packing the machine up to send back.

Conclusion

NEC's Direction Sm650AD is a good system, with a strong software bundle and decent speakers as well as the highlights already described. The 650MHz processor drops the performance on some applications, but the fast graphics card compensates on games and 3D graphics.

PCPlus Verdict

NEC DIRECT DIRECTION SM650AD

✓FOR	✗ AGAINST
→ GeForce2 MX graphics adaptor	→ 650MHz processor
→ NEC monitor	
→ Well-balanced software bundle	

Specifications	9
Quality	9
Value	10
Performance	7
OVERALL	**9**

Polar Premium D700

PRICE £800 **EX VAT** £681 **SUPPLIER** Polar Technology
PHONE 0800 138 1238 **ONLINE** www.polartechnology.com

Polar has done well with the configuration of this machine, which is ideal as an Internet PC

What you get

Polar's midi-tower case has room for seven drives, with up to five on the front panel, and includes a 12-speed Toshiba DVD and a standard floppy in this configuration. There's a 19.1GB IBM hard drive inside and this is well matched by a 700MHz Duron with 128MB memory.

The EPoX system board has six PCI slots and a single ISA for legacy cards and just one is used for a Diamond V90 modem. The power supply wasn't screwed in place on the machine we received, but Polar explained it had had to change the standard PSU for a more powerful 250W type before shipping – production machines have the right PSU fitted as standard.

The graphics adaptor is a Diamond Viper V770D, an nVidia TNT2-based card. This runs to a Hansol 710A monitor, like Mesh's. Just to prove an £800 PC can have some distinctive qualities, Polar includes a USB Internet camera with its kit, so you can make faces at your friends on the phone.

In use

The Premium D700 scored well under test, returning a **PC Plus** index of 1.27. 3DMark scores were just under 2,500 and Video 2000, which we had to nurse the system through, wouldn't complete the performance segment to return an index.

The keyboard and mouse are both from Digital and are fairly comfortable to use. The speakers, a larger than normal pair from Labtec, gave a comparatively well defined sound. The camera produced a usable picture for video conferencing, though you wouldn't want to take stills from it.

PCPlus BENCHMARK 1.27

Service and support

Polar offers a three year, back to base warranty, but covering both parts and labour. This is well above the norm and for business purchasers will cover the depreciated life of the machine.

Conclusion

This is a fair system with a strong spec and above average performance, except for its Video 2000 run. It's up to the type of tasks it would face as a family or home office machine and the USB camera is a useful extra. The software bundle is a bit thin, but hardware-wise there are few complaints.

PCPlus Verdict

POLAR PREMIUM D700

✓FOR	✗ AGAINST
→ 19.1GB hard drive	→ Missing screws on power supply
→ Above average speakers	
→ USB camera	

Specifications	9
Quality	8
Value	8
Performance	7
OVERALL	**8**

Systemax D650RV

PRICE £799 **EX VAT** £680 **SUPPLIER** Simply Computers
PHONE 08707 297644 **ONLINE** www.simply.co.uk

Simply's version of the Systemax is a machine with lots of bells and whistles, but poorly set up

What you get

Simply Computers, now part of the US Midwest Micro group, is keen to give the Systemax brand full credit in reviews, as there are several sources for the machines in the UK. So, the Systemax D650RV is a 650MHz Duron-based system with 64MB of memory and a 14.2GB hard drive. As you can see, so far everything is a little below the norm for this group and the application performance follows.

The high spots are a Zip 100 drive for removable storage, though with no Zip disk supplied, and a GeForce2 MX graphics card which bolsters game test results. The 17-inch CTX monitor is fair, though the tube face is quite curved. Sound from the VIA chipset runs to a pair of uninspiring Creative SBS52 speakers. A SideWinder gamepad is a useful bonus.

In use

The SYSmark 2000 result from the Systemax was disappointing, reaching only 90 per cent of our reference 600MHz Celeron machine. Given the known performance of the Duron, this is a very poor showing.

Thanks to the 32MB GeForce2 MX adaptor, 3D results were much better – indeed, the best in the group, with an index of 3,911 for the high resolution run. Video 2000 also produced an acceptable result, though some tests didn't display.

The keyboard is no better than fair, though the Logitech Pilot Plus mouse is comfortable and smooth to use.

PCPlus BENCHMARK 0.90

Service and support

Simply provides a three year back to base warranty with the Systemax D650V. Only the first year of this includes the cost of parts as well as labour and as with all back to base warranties, you're responsible for getting the machine dispatched to the company.

Conclusion

From our tests, the Systemax D650V appears to need some work on its processor set up. The graphics adaptor is obviously doing its stuff, but the processor does nothing special with business applications. The inclusion of a Zip drive for back-up and a gamepad is handy, but overall the value of the system isn't as good as elsewhere.

PCPlus Verdict

SYSTEMAX D650RV

✓FOR	✗ AGAINST
→ GeForce2 MX graphics adaptor	→ Slow processor set-up
→ Zip drive and gamepad included	→ No Zip disk included with drive

Specifications	6
Quality	8
Value	6
Performance	6
OVERALL	**6**

Titan Efficacy A705MT

PRICE £799 **EX VAT** £680 **SUPPLIER** Titan Systems
PHONE 0870 442 1248 **ONLINE** www.titanplc.com

Titan's Efficacy lives up to its name and should get the job done – as long as that job isn't DVD playback

What you get

Titan is one of only two suppliers to put Pentium III processors at the heart of their contributions to this test. Here it's a 700MHz version with 128MB of memory and a 19GB hard drive. There's a 52-speed CD drive fitted – the Efficacy is the only machine not to have a DVD or CD-RW.

Most unusual is the graphics adaptor, a Mighty Banshee from Innovision. Yes, that's right, this card is based on 3dfx's Voodoo Banshee chip, a device I never thought I'd see in a new PC again. While it was good in its day, it's not really a match for more recent Voodoos or virtually anything nVidia makes. The card runs a well above average 17-inch Iiyama monitor.

In use

The Efficacy performed very well on the SYSmark 2000 benchmark, beating the Big Red and Mesh machines by a whisker, though still some way behind the Atlas. The 3DMark test showed the Mighty Banshee's age, though, producing indexes that were half those of the GeForce2 MX-powered cards. The scores were still above those from machines using 810 or 815 chipsets, though, which says a lot about Intel's integrated graphics. The Video 2000 result was low, partly because of the lack of DVD support.

Titan includes a decent multimedia keyboard and one of Microsoft's new Intellieye ball-less mice. The combination is comfortable and should be trouble free.

PCPlus BENCHMARK 1.38

Service and support

Titan offers a one year back to base warranty, followed by four further years, labour only. This is better than a standard one year offering and costs a company little, assuming its technicians aren't already working at full stretch.

Conclusion

Efficacy, the latest in a line of unusual model names from Titan, means 'capable of producing the result intended'. We can't really argue with that, as the machine is fast and well appointed. It's a shame there's no DVD in there, nor any applications software, but for the right kind of buyer it could be a very sound choice.

PCPlus Verdict

TITAN EFFICACY A705MT

✓FOR	✗ AGAINST
→ Good performance	→ No DVD drive
→ Intellieye mouse	→ No bundled software
	→ Aging graphics card

Specifications	8
Quality	7
Value	8
Performance	9
OVERALL	**8**

Viglen HomePro PIII 733NLr

PRICE £799 **EX VAT** £680 **SUPPLIER** Viglen
PHONE 0990 486 486 **ONLINE** www.viglen.com

Viglen's HomePro is held back by its 3D graphics performance – it needs a separate graphics card

What you get

Viglen's HomePro PIII 733NLr midi-tower is well turned out, with a 10-speed DVD drive and a floppy in two of its four front-panel bays. Inside, there's a 19.1GB Western Digital drive, giving plenty of storage space.

Viglen is one of only three suppliers to stick with Intel in this group and fits a 733MHz Pentium III to an Intel system board. The board may only have two memory sockets and only 64MB of memory installed, but at least it has an AGP slot for a graphic adaptor. It needs one, as the machine currently relies on the graphics section of an Intel 815 chipset.

The video signal is handled by a decent 17-inch Viglen PL7 monitor, which gives a well-detailed picture on a reasonably flat tube face.

In use

Performance of the HomePro is a very mixed bag indeed. Its SYSmark result was well up with the leaders in this group, giving a **PC Plus** Index of 1.35. That's really where the good news ends, though. The 815 chipset sees to that.

It produced a 3DMark result of 901 at high resolution, which has the dubious honour of being close to the lowest result we've ever recorded on a desktop PC under 3DMark 2000 (Gateway's Essential is currently the lowest). Video 2000 didn't do much better, producing a low score of 1,199. With the 733MHz Pentium III as a power source, these disappointing figures have to be laid at the door of the 815 chipset.

PCPlus BENCHMARK 1.35

Service and support

Viglen includes a one year on-site warranty with the Home Pro, and also includes a delivery charge in the price of the machine. Carrera is the only other supplier to do this in this group.

Conclusion

There are some highlights in the HomePro PIII 733 NLr, such as the copious software bundle, but it's let down by the graphics performance of the 815 chipset. Fortunately, you can add you own graphics card in the AGP slot and you'd be sensible to do this if you want to use the machine for games.

PCPlus Verdict

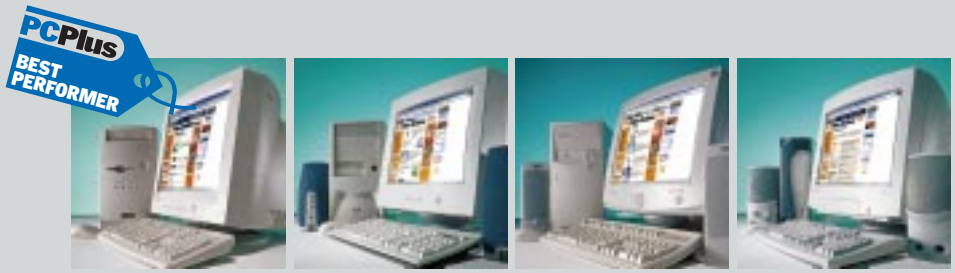
VIGLEN HOMEPRO PIII 733NLR

✓FOR	✗ AGAINST
→ Integral Ethernet connection	→ Poor 3D graphics from 815 chipset
→ Software bundle	
→ Plenty of expansion potential	

Specifications	7
Quality	9
Value	8
Performance	6
OVERALL	**7**

Which £799 PC?

Check the specs here...



CONTACTS	Meridian A700PL	Voyager	Octan DM700	Essential 600C
Supplier	Atlas	Big Red	Carrera	Gateway
Supplier type	Direct	Direct	Direct	Direct/High Street
Telephone number	07000 285275	08700 711117	020 8307 2800	0800 14 2000
Price	£800 (£681 ex VAT)	£800 (£861 ex VAT)	£799 (£680 ex VAT)	£821 (£699 ex VAT)
Warranty	1 year back to base	1 year back to base plus lifetime labour	2 years on-site	1 year on-site plus 2 years back to base
Delivery charge	£34	£24	Included	£42
Credit card surcharge	None	None	None	None
SPECIFICATIONS				
Proc. type – speed (MHz)	Athlon – 700	Duron – 700	Duron – 700	Celeron – 600
System board	Gigabyte GA-7ZM	FIC AZ11	Abit M7VKA	Microstar 6312
Chipset	VIA KT133/686A	VIA KT133/686A	VIA KT133/686A	Intel 810E
Memory bus speed (MHz)	133	100	133	66
Available memory (MB)	128	128	64	128
Maximum memory (MB)	1.5GB	1.5GB	1.5GB	512
Secondary cache (K)	256	64	64	128
Hard drive capacity (GB)	19.0	15.7	14.2	14.3
Hard drive make	Fujitsu	IBM	Fujitsu	Western Digital
CD-ROM make – speed	Asus – DVD 8x	Samsung – DVD 8x	Panasonic – DVD 10x	LG – CD 48x
Other drives and devices	Floppy, AMR V90 modem	Floppy, V90 modem	Floppy, 56K software modem	Floppy, 56K software modem
EXPANDABILITY				
ISA Expansion slots – free	0	0	0	0
PCI Exp slots – free, AGP	3 – 3, 1	5 – 4, 1	2 – 2, 1	2 – 2, 0
Serial ports	2 x 9, 2 x USB	1 x 9, 2 x USB	2 x 9, 2 x USB	5 x USB
Parallel	1	1	1	0
GRAPHICS SYSTEM				
Monitor	CTX PL7	Lite-On B1770NSL	LG Studioworks 775c	Gateway EV700
quoted diagonal (in)	17	17	17	17
measured diagonal (in)	16.00	15.75	16.00	16.00
dot pitch (mm)	0.27	0.27	0.27	0.28
Video adaptor	nVidia Riva TNT2	Voodoo3 3000	nVidia TNT2	Intel 810E
video memory (MB)	32	16	32	Main memory
SOUND				
Sound card	VIA PCI Audio	VIA PCI Audio	VIA PCI Audio	AC Link
Speakers	TEAC Powermax 80/2	Diamond Audio DPM2012	Altec Lansing ACS22	Cambridge S/W GCS5200
EXTRAS				
Make of mouse	Logitech Pilot Plus	Ideal	MS Intellimouse	Web Rider
Operating system	Windows 98 SE	Windows 98 SE	Windows ME	Windows ME
Bundled software	SmartSuite Millennium, DVD/CD-RW/modem/ sound utils	DVD/CD-RW/ modem/ sound utils	DVD/modem/sound utils	MS Works Suite 2000, CD/modem/sound utils
BIOS make	AMI	Award	Award	AMI
Power – Suspend (W)	1 –	161 – 53	151 – 53	115 – 38
Faults as supplied	None wouldn't complete	Video 2000	None	None
VERDICT	9	8	7	7

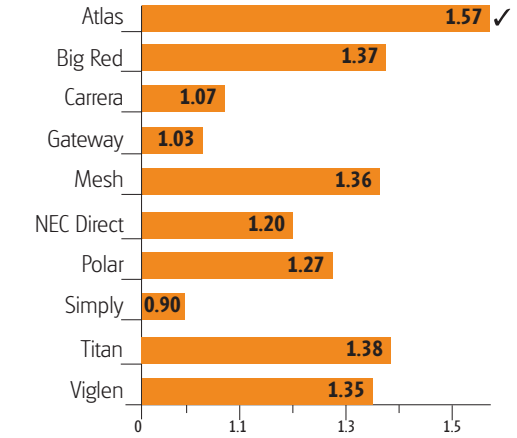
Matrix 700D	Direction Sm650AD	Premium D700	Systemax D650RV	Efficacy A705MT	HomePro PIII 733NLr
Mesh	NEC Direct	Polar	Simply Computers	Titan	Viglen
Direct	Direct	Direct	Direct	Direct	Direct
020 8208 4706	0870 333 6329	0800 138 1238	08707 297644	0870 442 1248	0990 486 486
£799 (£680 ex VAT)	£799 (£680 ex VAT)	£800 (£681 ex VAT)	£799 (£680 ex VAT)	£799 (£680 ex VAT)	£799 (£680 ex VAT)
1 year on-site plus 2 years back to base	1 year on-site	3 year back to base 2 years labour only	1 year back to base plus 4 years labour only	1 year back to base plus	1 year on-site
£40	£34	£29	£35	£35	Included in price
None	None	3%	None	None	None
Athlon – 700	Duron – 650	Duron – 700	Duron – 650	Pentium III – 700	Pentium III – 733
Asus A7V	Microstar MS-6340	EPoX EP-8KTA	Abit M7VKB	Gigabyte GA-6VXE7+	Intel D815EEA
VIA KT133/686A	VIA KT133/686A	VIA KT133/686A	VIA KT133/686A	VIA Apollo Pro	Intel 815
100	133	100	133	100	133
128	64	128	64	128	64
1.5GB	1.0GB	1.5GB	1.5GB	1.5GB	512
64	64	64	64	256	256
19.0	19.0	19.1	14.2	19.1	19.1
Western Digital	Maxtor	IBM	Maxtor	Western Digital	Western Digital
Pioneer – DVD 16x	LG – CD-RW 8x4x32	Toshiba – DVD 12x	Pioneer – DVD 10x	Samsung – CD 52x	Sony – DVD 10x
Floppy, V90 modem	Floppy, V90 modem	Floppy, Diamond V90 modem	Zip 100, floppy, V90 modem, SideWinder gamepad	Floppy, V90 modem	Floppy, Diamond V90
0	0	1 – 1	1 – 1	2 – 2	0
5 – 3, 1	3 – 2, 1	6 – 5, 1	5 – 4, 1	5 – 3, 1	5 – 4, 1
2 x 9, 5 x USB	2 x 9, 2 x USB	2 x 9, 2 x USB	2 x 9, 2 x USB	2 x 9, 2 x USB	2 x 9, 2 x USB
1	1	1	1	1	1
Hansol 710A	NEC VR17	Hansol 710A	CTX VL700	Iiyama S700JT1	Viglen PL7
17	17	17	17	17	17
15.75	15.75	15.75	16.00	16.00	16.00
0.27	0.28	0.27	0.27	0.27	0.27
ATI Xpert 2000	GeForce2 MX	Diamond V770D	3D Power GF2 MX	Mighty Banshee	Intel 815
32	32	32	32	32	Main memory
Creative SB 128	VIA PCI Audio	VIA PCI Audio	VIA PCI Audio	Creative SB 128	AD1885
TEAC Powermax 80/2	Labtec LSC1060	Labtec Spin-60	Creative SBS52	Busby 71002	Altec Lans ACS33
MS Intellimouse	Logitech Pilot Plus	Digital	Logitech Pilot Plus	MS Intellieye mouse	MS Intellimouse
Windows 98SE	Windows 98 SE	Windows 98 SE	Windows ME	Windows 98 SE	Windows 98SE
MS Works Suite 2000, DVD/modem/sound utils	MS Word, MS Works, CorelDRAW 7, Encarta 99, MS Money, AND Route 99, Voice Express Pro, DVD/ modem/sound utils	Smartsuite Millennium, DVD/modem/sound utils	SmartSuite Millennium, Norton Utilities, DVD/ Zip/modem/sound utils	CD/modem/ sound utils	MS Works 2000, Home Tutor Pack, Entertainment Pack, Education Pack, DVD/ modem/sound utils
Award	AMI	Award	Award	Award	Intel
168 – 62	158 – 53	175 – 108	170 – 103	137 – 48	144 – 60
None	None	Video 2000 run incomplete. PSU screws missing	Some Video 2000 tests wouldn't display	None	None
10	**9**	**8**	**6**	**8**	**7**

PCPlus BENCHMARKS

Our benchmark is designed to provide a quick and thorough guide to overall system performance. We test individual aspects of performance.

For full in-depth details on how our benchmarking system works, please visit **www.pcplus.co.uk/bench**.

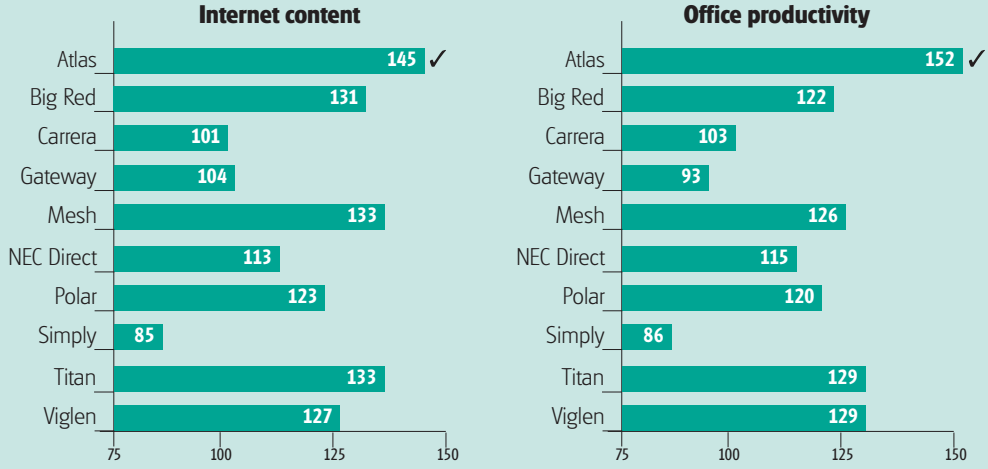
PCPlus Combined benchmark scores



PCPlus BENCHMARK Results

The overall PC Plus benchmark score is an amalgamation of our benchmarks and is indexed against a standard 500MHz Intel Celeron system. This means you can instantly see just how fast any PC system is.

SYSmark 2000 results



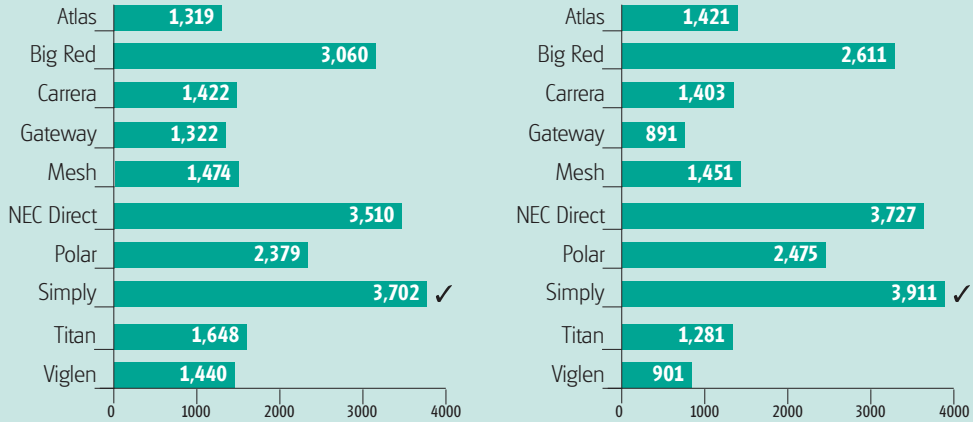
SYSmark2000 puts each system through 12 timed scripts using Microsoft Word, Excel, PowerPoint, Adobe Photoshop, Premiere and CorelDRAW among others. The results are averaged to produce two results, one gives the power of a PC for office applications and the other for Internet content creation.

Video 2000 results

	Features	Performance	Quality	Overall
Atlas	595	719	1,102	2,416 ✓
Big Red	Wouldn't complete tests			
Carrera	595	588	1,100	2,288
Gateway	369	217	518	1,105
Mesh	493	672	1,060	2,225
NEC Direct	599	222	784	1,604
Polar	581	n/a	986	n/a
Simply	599	624	784	2,006
Titan	552	229	433	1,214
Viglen	369	312	518	1,199

Video2000 tests the performance of MPEG decompression – this means you get a sense of how good the system is at playing video.

3DMark 2000 results



We use 3DMark running at two resolutions. This assesses the suitability of a PC for 3D games and rendering applications.

PCPlus LABS

PCPlus VERDICT

£799 can buy you a great leisure or home office PC, with a lot of potential in both performance and function. The top machines in this review stand up against systems from other sources costing a lot more.

Analysis

SIMON SAYS

If you buy a PC which includes Windows as its operating system, would you be happy to receive the copy pre-installed on the hard drive, without a master CD? This is exactly what Microsoft and some larger OEM suppliers are intending to do.

Many OEMs already buy their copies of Windows pre-loaded on hard drives of their choice. This is obviously a lot cheaper for them than having to install the operating system from a CD on every machine they sell and I for one have no desire to deny them this convenience. If that were the only copy of the operating system I received, though, I would be hollering, in the words of Harry Enfield's redneck Frank Doberman character 'Oi, Microsoft, No!'

Although these OEM suppliers are intending to provide a 'recovery' CD and a snapshot program, so you can replace a corrupted copy of the operating system with an earlier, working version, or reinstall the sections of Windows needed to get it up and running again, there will be no option to reformat and re-install the operating system from scratch.

Okay, there aren't that many people who want to regularly reinstall Windows straight onto a newly formatted hard drive. I can also see how it could radically curb software piracy and cost Microsoft less in fancy hologrammed master CDs. There are occasions, though – as when a virus trashes key sectors of your hard drive – where there's no other option.

It seems that people buying software licences are coming under more and more onerous restrictions from the licenser. We already have software that wants to check back to its Web home page before granting you access – hardly ideal if you don't happen to have an Internet link. Now the operating system on which everything else runs may only be complete on your, still vulnerable, hard drive.

EDITOR'S CHOICE

Mesh Matrix 700D

PRICE £799 **EX VAT** £680
SUPPLIER Mesh Computers
PHONE 0208 208 4705
ONLINE www.meshplc.co.uk

Mesh has packed a lot into its Matrix 700D and the combined package is fast and well specified. Using an Athlon rather than the trendier Duron processor, there's plenty of processing muscle inside the case. With 128MB of memory and a healthy 19.1GB hard drive, there'll be nothing to really challenge the hardware in the next year or so.

One of the key features which attracts me to this system is its use of conventional, known name add-in cards for modem and sound. So many of these systems use integrated sound and communications chips which are, in nearly all cases, inferior to custom-made devices.

The ATI graphics adaptor may not have the 3D kick of a GeForce2 chip, but it does have all the extra facilities for TV output and video work, which give the machine a lot of scope in the home environment. A good software bundle rounds off what is an excellent, soundly-balanced system.

PCPlus Verdict 10/10

BEST VALUE

NEC Direct Direction Sm650AD

PRICE £799 **EX VAT** £680
SUPPLIER NEC Direct
PHONE 0870 333 6329 **ONLINE** www.nec-online.co.uk

NEC Direct is providing better and better value in the machines it sells direct. This Direction Sm650AD has some very impressive features, particularly its CD-RW drive and the GeForce2 MX graphics card. NEC's impressive buying power also shows in the excellent software bundle included with the system. If it hadn't been for the slower 650MHz Duron, it would have been very hard to choose between this machine and the Mesh.

PCPlus Verdict 9/10

BEST PERFORMER

Atlas Meridian A700PL

PRICE £800 **EX VAT** £681
SUPPLIER Atlas Technologies
PHONE 07000 285275 **ONLINE** www.atlasplc.com

There were two machines in this group using 700MHz Athlon processors at their core. Mesh, the eventual winner, produced a good **PC Plus** Index of 1.36, but Atlas did even better and scored 1.57, over 13 per cent faster. The rest of the specification was also good, though the Riva TNT2 graphics adaptor wasn't up to the GeForce2 MX in the NEC system. If you want the last drop squeezed from your PC for application work, you're unlikely to get better for £800.

PCPlus Verdict 9/10

CONTENTS

→ Buying info

It pays to shop around if you're planning to purchase a new monitor. You can probably find what you're looking for at on of the new PC hypermarkets that are springing up all around the country and the adverts in **PC Plus** will give you a good idea of what's available and who's offering the best prices. You can always have a look at the PC Index at www.pcindex.co.uk. Monitors can be expensive to deliver and many companies offer free delivery if you order over the Net. I recently bought a new monitor through Insight www.insight.com, using their on-line shopping facility. You will have to use their secure shopping feature and a credit card but I got the best price, no delivery charge and it was delivered the next day.

Changing your point of view

Time for a change? Paul Warner takes a look at some of the latest 17- to 19-inch monitors and gives you the lowdown on the best deals

When you first sit down in front of a new machine it's probably the quality of keyboard, mouse and screen that creates your first impression. It may be the fastest bit of silicon in the world but, if your interface is below spec, then the whole experience can leave much to be desired. Squiggly mice that need thumping to get the cursor moving and soggy keyboards that have a mind of their own detract from the ease of using your computer, but perhaps the single greatest influence will be the quality and size of monitor. It's not dissimilar to sound reproduction. You may have the greatest CD player in the world but pipe it into some cheap speakers and all you'll hear are cheap speakers.

In the quest for greater performance you may well have boosted your processor, added more RAM, brought the latest graphics card or even gone the whole way and replaced the system board. This is fine but it's usually the monitor that gets left out of the list. If you're buying a new system, then many manufacturers will cut back on quality components to get the best 'deal' on the street. The monitor is one area where they can make a considerable saving and we would always recommend that you check the specification of the monitor before committing yourself to some new kit. An alternative option is to buy your computer without a monitor and source it separately, that way you get exactly what you want.

The days of 14-inch monitors are over and entry-level specs usually start about 15 inches. This can be misleading as monitor sizes are measured as the diagonal size of the tube. The amount of screen that is visible can be considerably less. We've come across several 15-inch monitors that barely measure 14. If you are looking to upgrade then 17-inch monitors have now become a popular choice and their costs are nearer to the price that a 15-inch would have set you back, just a year ago.

This month **PC Plus** has managed to get hold of a selection of the best 17 and 19-inch monitors. Many manufacturers are offering flat screen displays as standard and extras like built in USB hubs, speakers and microphones are available. Some of the latest graphics cards have digital output and one review monitor has digital connection. This moves the digital to analog signal conversion from the graphics card into the monitor and should produce improved image quality, as the converter is an integral part of the monitor, directly matched to the display. It won't be long before this becomes the default connection for both flat panel and standard CRT displays.

ADI G910

PRICE £405 **EX VAT** £345 **SUPPLIER** ADI
PHONE 020 8327 1900 **WWW** www.adieurope.com

The ADI G910 has a very high resolution with a very high price to match

Tested on
Matrox G400 on Pentium 500

This is ADI's latest 19-inch monitor to use the FD Trinitron pure flat tube. It was first launched in April of this year and features a 0.24mm aperture grille. It doesn't come with a USB hub, but does have the option to fit one, this will set you back another £16. The monitor includes an internal microphone with a rear connector and a pair of optional speakers can be fitted. ADI produces a range of this style of monitor, from an entry level 15-inch, at an aggressively priced £125, to this one priced at £345 plus VAT.

Installation is all Plug-and-Play under Windows 9X and was very simple. The OSD (on screen display) controls are comprehensive and include over scan and H/V-linearity controls alongside the normal geometry and colour adjustments. Both contrast and brightness use separate controls, these are probably the most often used and it does make sense to make them independent of the OSD menu to set them up.

ADI include a copy of the excellent Colorific software. This enables you to set up your screen for critical colour matching. Using a colour matching card and a series of on screen tests, Colorific will help you to adjust your monitor to specific colours under your local ambient lighting. This is most useful if you're trying to edit skin tones. One of the commonest problems is colour-matching scanner to screen and printer. Using Colorific enables you to set up your monitor for realistic colour matching, so that what you see is what you print.

The 910 will run at 1,792 x 1,344 at 75Hz. I found this uncomfortable and settled for the more realistic 1,280 x 1,024. Initially, the screen resolution appeared disappointing with some ghosting of images close to the edges. However, once it had warmed up, these settled down to give a typical high quality Trinitron output.

This isn't quite the best 19-inch we've seen but it delivered the goods and with ADI's aggressive pricing you may be able to pick one up at even better than the RRP.

PCPlus Verdict

ADI G910

✓FOR	✗ AGAINST
→ Trinitron Tube and reasonable price	→ Not the sharpest FD screen we've seen

Specification	8
Quality	8
Performance	8
Value for money	8
OVERALL	**8**

Eizo Flexiscan T561

PRICE £387 **EX VAT** £329 **SUPPLIER** Professional Display Systems Ltd
PHONE 01483 719500 **WWW** www.eizo.co.uk

This state-of-the-art flat screen comes with two sets of inputs for an extra PC

Tested on
Matrox G400 on Pentium 500

The FlexiScan T561 is Eizo's very latest 17-inch flat screen monitor and represents their state-of-the-art screen. From the moment we unpacked the box it was obvious that this was a monitor to be reckoned with. It doesn't come with any fancy extras but has a high build quality and exudes quality. An optional i-Sound unit is available for multi-media use and an adaptor is obtainable to connect the Mac.

When I connected the monitor to our test machine, I discovered a set of BNC connectors as well as the normal 15 pin VGA connection. These enable a separate RGB cable to be used instead of the standard video cable. One useful feature is that a second computer can be attached to the monitor. A BNC/D-Sub selection button on the front of the monitor enables the different inputs to be switched. Individual adjustments for each input can be saved, so your brightness/contrast, video level and colour temperature can be adjusted and saved for each input. As you switch, the monitor re-establishes the settings for each computer.

The monitor will run comfortably at the maximum resolution of 1,600 x 1,200 but is most useable at 1,280 x 1,024. We didn't notice any visible distortion at this setting and with the extremely flat screen, it produced a very acceptable image. The OSD offers a wide range of adjustments; all the normal geometric settings are available.

A couple of extra features are worthy of note. I used a Matrox G400 graphics card for the tests and this generally produces a good image. Some monitors do exhibit a degree of image shadowing, especially at the edges and Eizo has included a signal filter to help match the monitor to your graphics card and remove this type of distortion. A video level adjustment is also available to balance the output level of your graphics card to the monitor.

I liked this monito: not too many gimmicks but a superb image on a dead flat screen. Very nice.

PCPlus Verdict

EIZO FLEXISCAN T561

✓FOR	✗ AGAINST
→ Great image quality and dual function features	→ Not a lot – just the price

Specification	8
Quality	9
Performance	7
Value for money	9
OVERALL	**9**

Hansol 900P

PRICE £250 **EX VAT** £213 **SUPPLIER** Hansol
PHONE 01252 360400 **WWW** www.hansol.co.kr

Not renowned for producing cheap monitors, Hansol present us with the 900P: high quality, low price

Tested on
Matrox G400 on Pentium 500

Hansol has had an enviable reputation for supplying good value monitors and in the case of the 900P they have excelled themselves. Watford is offering it at £250 inclusive of VAT and for a 19-inch monitor that's got to be great value. I didn't expect too much at this price but was pleasantly surprised. The initial impression is of quality, the case is well made and looks good. There are no extra features, you get a straightforward 19–inch unit with a single VGA connection and no hubs or sound facilities – at this sort of price who's going to argue.

Installation is simple enough, the monitor is Plug and Play and installed on our test machine, running Windows 98, without problems. In fact the screen image at 1,200 x 1,024 hardly needed adjustment. The monitor controls are quite sparse but don't be deceived; they are more than adequate. Rather than a set of OSD control buttons, Hansol has elected to use a rotary button. It's more like a shallow game controller on the front of the screen. Push it and you get OSD, the button has a light touch and has up/down and left/right response enabling selection and adjustment of a comprehensive range of on screen settings. These include pin balance, useful to correct differences in side pin cushioning so that it can be balanced prior to correction. Corner correction also enables the removal of accentuated pin cushioning at the image corners.

The monitor also includes a universal power supply. This is a feature that we're seeing more often on equipment. By including a power supply unit that can work on any voltage from 100 – 240 volts at both 50 and 60Hz, Hansol has ensured that the monitor will run anywhere on the planet (provided there's a power supply.) This makes for simpler manufacturing and distribution and enables Hansol to produce these monitors at a competitive price.

If your looking for a good quality monitor at the right price this has to be worth a look. It easily takes our value award.

PCPlus Verdict

HANSOL 900P

✓FOR
→ Exceptional value for a good monitor

✗ AGAINST
→ Not quite up to the performance of the FSD monitors

Specification	8
Quality	9
Performance	9
Value for money	9
OVERALL	**8**

Iiyama S900MT1

PRICE £246 **EX VAT** £209 **SUPPLIER** Iiyama
PHONE 01438 745482 **WWW** www.iiyama.co.uk

The Iiyama S900MT1 19-inch is a high quality monitor for a lower price than their previous 15-inch screen

Tested on
Matrox G400 on Pentium 500

A couple of years ago we had to pay nearly £400 for a 15-inch Iiyama VisionMaster. At that time they were considered one of the best. Well the Iiyama range has continued to grow and the S900T1 has been introduced as a value 19-inch. At just under £250 inclusive, this should be great value for a 19-inch FST monitor.

When I unpacked the unit it was much in the standard Iiyama livery. There aren't any extra features but a solid, well-made case with a set of OSD control buttons at the base of the facia. Installation was the standard Plug-and-Play. Most of the 19-inch monitors come in at around 20Kgs and it can be a backbreaking job to unpack and set up. The Iiyama is no exception and quite a bulky monitor, so do get some help if you decide to buy one of these larger monitors.

The monitor is another of the universal power supply models, so it should work in most areas. When I powered up it only required a little adjustment to get the screen centred at the maximum resolution of 1,600 x 1,200. This didn't produce a great image, with slight falling off of quality at the extremities. Reducing the screen to 1,240 x 1,024 improved things, but I still noticed a little ghosting at the extremities. After the monitor had been running for a while this improved noticeably. The CTX 19-inch monitor, that has won several awards, exhibits a similar condition and when first switched on, the image looks relatively poor. It takes about ten minutes after switching on for things to improve markedly.

The OSD is the more typical four-button type and has most of the standard geometric controls, including rotation.

At under £250 for a 19-inch FST screen, this has to be exceptional value for money. The image quality did start to fall away at the higher resolutions, but after warming up at normal resolution it was good. This will do nothing to harm Iiyama's reputation.

Overall, an impresive monitor at a very decent price.

PCPlus Verdict

IIYAMA S900MT1

✓FOR
→ Solid well built monitor with FST tube

✗ AGAINST
→ Not the sharpest at higher screen resolutions

Specification	8
Quality	8
Performance	9
Value for money	8
OVERALL	**8**

One of the best all rounders.

LG StudioWorks 912U

PRICE £298 **EX VAT** £254 **SUPPLIER** LG Electronics
PHONE 0870 6075544 **WWW** www.lgelectronics.co.uk

Perfect for those with limited desk space, LG has a 19-inch monitor that fits into small places

Tested on
Matrox G400 on Pentium 500

Over recent years we've seen more and more decent kit coming from LG. The StudioWorks 912U is their latest 19-inch high resolution monitor and aimed as a low cost entry level monitor for multi-media and CAD. As supplied it's suitable for connection to a standard PC but with the optional connector can be used with a Mac.

Installation is straightforward with full Plug-and-Play compatibility. As well as the standard 15-pin VGA socket at the rear of the monitor, you'll find five other ports. One is a USB Upstream port for connection to your PC with the supplied cable. The other four are standard Downstream ports for connecting USB peripherals. With many devices now using USB as standard, this is a useful way to connect anything from printers and scanners to keyboard, mice or USB speakers – saves all those cables getting knotted up at the rear of your box.

The LG screen resolution is good, not quite up to the standard of the Trinitron tubes, but above average for an entry level monitor. With full screen graphics, the screen colour saturation was rich giving full blacks without having to increase the contrast too much, which is ideal for editing skin tones.

A monitor software function is available through the USB connection, from the displays property you can adjust many of the onscreen controls. Set up size, position, and colours, even degauss the screen – a very neat feature. Like most of our review monitors the screen is reasonable at the maximum resolution of 1,600 x 1,200 but improves at 1,280 x 1,024.

One feature that may prove useful, for anyone with limited desktop space, is the depth, at just over 400mm it's quite shallow and would fit on a narrower workbench than most of the 19-inch monitors. This is a well-built monitor with plenty of room for expansion through the USB ports.

As a reasonably priced, all round monitor, it is certainly worth considering.

PCPlus Verdict

LG STUDIOWORKS 912U

✓FOR	✗ AGAINST
→ Good quality 19-inch monitor with extra USB port	→ Not a lot, unless you're looking for an ultra sharp FST monitor

Specification	9
Quality	9
Performance	9
Value for money	9
OVERALL	**9**

Very nearly the best Trinitron screen I've seen.

Mitsubishi Diamond Plus 91

PRICE £367 **EX VAT** £313 **SUPPLIER** Mitsubishi
PHONE 01707 282837 **WWW** www.necmitsubishi.com

If you are plagued by eye strain, the Mitsubishi Diamond Plus 91 could be the answer

Tested on
Matrox G400 on Pentium 500

The Mitsubishi range of monitors has had many accolades over recent months and is regarded as one monitor that others can be judged by. They have held the crown for some time but recently monitors from manufacturers like CTX have started to challenge them. The Diamond range uses a special surface coating to reduce glare and supposedly eyestrain. When we first switched on the Diamond Plus 91 it was obvious that this was a monitor to be reckoned with.

It's a fairly heavyweight unit even for a 19–inch monitor and comes in at 23Kg – so watch out for back ache if you are thinking of buying one. I plugged it into our test machine with a Matrox G400 card and everything worked first time. The screen set up was about correct. If you're fussy about these things, then you can adjust almost everything with the OSD. Not only does it have all the normal geometric adjustments but has specialist features like Corner Purity. This enables individual adjustment of each corner of the screen.

Other adjustments include Clamp Pulse Position to clamp the video signal at the front or the back of the H-sync pulse, apparently this can be useful to adjust excessive green or white backgrounds when an external sync signal is applied, a condition commonly found with older Macs.

The Plus 91 will work well up to 1,600 x 1,200 resolution and is one of the most comfortable to view at this resolution. It's great if you're working with graphics, but for general use the 1,200 x 1,024 is still a safer bet. For graphics specialists the video enhancement circuitry (fine picture mode) maximises contrast and colour saturation based on image content. I run an earlier version of this monitor and one thing that niggles on the Mitsubishi tube are the lines. Take a close look at the screen and you'll see a pair of very fine lines across the screen. They are a feature of all aperture grill monitors, but you soon stop noticing them. This is a very nice monitor. It is expensive but it's definitely work considering if you have the money.

PCPlus Verdict

MITSUBISHI DIAMOND PLUS 91

✓FOR	✗ AGAINST
→ One of the best with comprehensive range of adjustments	→ You have to pay for it

Specification	9
Quality	8
Performance	8
Value for money	9
OVERALL	**9**

NEC MultiSync FE750

PRICE £316 **EX VAT** £229 **SUPPLIER** NEC
PHONE 0845 1219200 **WWW** www.necmitsubishi.com

Beautifully built with sophisticated controls. Perfect for graphic design and art packages

Tested on
Matrox G400 on Pentium 500

A couple of years ago if you wanted the best you bought a Nec MultiSync, recently they've had a lot more competition from other manufacturers, but they are now linked in with Mitsubishi and their latest range of MultiSync monitors are with us. The FE750 is the 17-inch version aimed at the semi professional end of the market. At £316, it's not the cheapest monitor I've seen, however this is definitely a quality monitor.

Installation is all Plug-and-Play basically plug and go. The 750 is a straightforward monitor with simple facia buttons to control the OSD. This is very comprehensive and on top of the normal geometry controls, NEC has included several sophisticated OSD tools to get the very best from the display. A moiré canceller helps reduce on screen interference patterns, Basic Convergence enables the adjustment of RGB convergence to achieve a perfect white.

Other controls are available for individual corner adjustment and one of the most interesting is the Linearity control. This gives adjustment to spacing over individual sections of the screen, helping to ensure that a 2cm circle is exactly 2cm in diameter wherever it's drawn on the screen. The larger versions of this monitor even include adjustments to remove interference from the earth's magnetic field.

On test I achieved a near perfect image at the highest resolution, I could have spent some time trying to set up for accurate dimensioning and corner control but wouldn't have improved much on the default setting. Colour was accurate and fully saturated.

This is a beautifully built monitor with a very sophisticated set of controls, ideally suited for the discerning graphics artist or designer. It may not be the cheapest 17-inch monitor but does produce an excellent image, build quality is high and this monitor wouldn't look out of place on any desktop. Having seen this I'm going to have a closer look at some of the larger monitors in the series – very impressive.

PCPlus Verdict

NEC MULTISYNC FE750

✓FOR
→ Exceptional quality image

✗ AGAINST
→ I haven't got one

Specification	9
Quality	9
Performance	9
Value for money	10
OVERALL	**9**

Nokia 446Pro

PRICE £428 **EX VAT** £365 **SUPPLIER** Nokia
PHONE 0800 833648 **WWW** www.viewsonic.com/europe

The mobile phone leaders have produced this professional monitor with a high quality display

Tested on
Matrox G400 on Pentium 500

My first impression of the Nokia 446Pro was of size, this is a big heavy monitor. In this case big is beautiful and, at over 23Kgs, you'll need a decent desktop and a strong back. When I review monitors I usually try to lift them out of their boxes but in this case I had to adopt the recommended approach, turned it upside down and removed the box from the monitor.

Nokia supply a full set of manuals and drivers on CD. These are quite comprehensive and come in several languages. The only paper documentation is a simple installation guide that should be enough to get you up and running. The monitor installs perfectly as a Plug-and-Play device but additional drivers are provided on the CD.

The initial impression was very good. The monitor was sharp from edge to edge at the highest resolution of 1,600 x 1,200 at 85Hz. Most monitors drop off to 75Hz at these resolutions but the 446 Pro manages to maintain a reasonable performance at up to 85Hz. Its bigger brother, the 445Pro, can achieve 1,800 x 1,440 at 80Hz. For the test shots I used 1,280 x 1,024, and at this resolution the image was excellent, no fall off at the extremities or sign of image ghosting.

When the OSD menu isn't used, the facia buttons control, contrast and brighten. Open up the menu and they control the menu options and adjustments. These are comprehensive and enable the setting up of all the usual geometric controls. Auto control will take the best shot and in most cases worked fine. More sophisticated controls enable the adjustment of image sharpness by controlling colour convergence. Once you've set it up just as you like it, you can lock the OSD with a password and prevent anyone else from adjusting them.

This is a professional monitor at a reasonable price. Colour accuracy and image are high. If you have got the room to accomodate such a large monitor, then you won't be disappointed.

PCPlus Verdict

NOKIA 446PRO

✓FOR
→ High quality image and colour rendition

✗ AGAINST
→ Bulky

Specification	8
Quality	8
Performance	8
Value for money	9
OVERALL	**8**

Philips 107T

PRICE £222 **EX VAT** £189 **SUPPLIER** Philips
PHONE 01756 702892 **WWW** www.pcstuff.philips.com

Trying to cram everything into a small space is made easier with this 17-inch monitor from Philips

Tested on
Matrox G400 on Pentium 500

The first thing you find out about the latest Philips 107T is that it's smaller than all the rest. Not the screen, that's about average for a 17-inch monitor. Some clever design has enabled Philips to squeeze their tube into one of the smallest cases I've come across. The monitor is almost a pyramid in section with the top much narrower than the bottom. Once used to it – an aesthetically pleasing shape.

Documentation comes on a CD. This is fine if you're up and running with a CD player working. Anyone setting up their machine from scratch might be happier with some installation details on paper. Installation was uneventful, with full P&P compatibility. If you're into multi media, Philips supply a couple of optional extras that may appeal.

A USB hub can be attached to the underneath of the back of the monitor. This will give you a connection to your USB connector on the back of a PC and extra ports for connecting peripherals to the monitor. Another base unit is also available, this includes speakers with a bass boost and has connections for your sound card to connect to microphone and headphone jacks.

Image quality at the maximum resolution wasn't up to the level of some of the other monitors. However, when using Photoshop for our test screen shots it produced an accurate colour image with full blacks and good saturation. OSD controls are standard. A single button opens the menu and the other four enable adjustment and selection of menu items. These cover most of the normal geometric adjustments and include a wide range of colour adjustment. The 107 doesn't have the auto adjust features available in the larger monitors of the range.

If you're stuck for space this is a great choice. With the additional multi-media and USB options, it would be ideal for an all round machine. It's a machine suitable for students trying to cram everything into a small room at a very reasonable price.

PCPlus Verdict

PHILIPS 107T

FOR
→ Compact size at a reasonable price

AGAINST
→ Not the sharpest at high resolutions

Specification	7
Quality	8
Performance	9
Value for money	8
OVERALL	**8**

Samsung SyncMaster 900SL

PRICE £363 **EX VAT** £309 **SUPPLIER** Samsung
PHONE 0800 521652 **WWW** www.samsungelectroncs.co.uk

The Samsung SyncMaster 900SL is a space saving monitor and has a unique blue strip

Tested on
Matrox G400 on Pentium 500

Samsung have rolled out a set of three new monitors. 14, 19 and 21-inch versions of their SyncMaster high resolution monitors. I looked at the middle of the range 19-inch version and at just over £360, it's competitively priced for a quality monitor. The SL stands for Short Focal Length and it has a new space saving design enabling the case to be much shorter than normal. The case does have a mid blue highlight strip across the top – a bit á la Mac, you'll either love it or hate it.

Both D-SUB and BNC inputs are provided so you could use this monitor with a couple of PCs and toggle between them – ideal if you have a network of internet server that only needs occasional access for maintenance. The SyncMaster comes with an installation CD; this includes the excellent Colorific Screen management software. Colorific enables you to adjust the screen colours to your local environment, so that you see true colours under your local lighting conditions-very useful for graphics artists.

Installation is standard Plug-and-Play and will search for the drivers on the CD if they are required. Once installed, the image was stable at the maximum resolution of 1,600 x 1,200 at 76Hz, but as with most of the monitors in this roundup, the 900SL was more comfortable at 1,280 x 1,024 at the higher refresh rate of 85Hz. At this setting the image was sharp from edge to edge with no sign of any ghosting or distortion.

An optional hub stand is available giving an extra four ports on the base of the stand. OSD controls are adjusted using a selection of buttons on the front facia. These give all the usual geometric and image colour adjustments and also include moiré and focus controls.

An information button next to the OSD controls will tell you the details of scan rates and resolution being sent with the signal from your computer.

The Syncmaster is a good all round monitor at a reasonable price.

PCPlus Verdict

SAMSUNG SYNCMASTER 900SL

FOR
→ Compact size and good performance

AGAINST
→ Not too fond of the blue stripe

Specification	8
Quality	8
Performance	8
Value for money	8
OVERALL	**8**

Sony MultiScan E200

PRICE £241 **EX VAT** £205 **SUPPLIER** Sony
PHONE0990 424424 **WWW** www.world.sony.com

Sony's MultiScan flat screen is brilliantly designed and has a brilliant price to match

Tested on
Matrox G400 on Pentium 500

Some things in this world just feel right and Sony seems to have more than their share of designs that fulfil this criteria. The E200 is their latest MultiScan flat screen monitor, and I was immediately impressed by the build quality of this 17-inch monitor. At 20Kgs it's not a lightweight, but Sony has succeeded in squeezing it all into a relatively small case. Installation is Plug-and-Play and Sony supplies a floppy disk with the latest monitor information file for Windows 98.

Screen set up is interesting. When I initially switched on, the display was fairly accurate. However to adjust the settings you need to use the control button. This is neatly tucked away under the front edge of the monitor and leaves an uncluttered front bezel, improving the overall design of the viewing area. This control button is similar to one we've seen on the Hansol monitor earlier in the review and functions as an all in one controller. Press the button and it brings up the OSD. You can then tip the edge of the button in four directions to control left-right and up-down adjustments to menu choice or individual adjustments. It's a bit fiddly at first but once you get the hang of it you'll find it indispensable.

Most geometric adjustments are available and extra features include convergence, colour temperature, moiré and degaussing. I found that the default set up was almost spot-on; a small reset button will return the monitor to the factory default setting if you want to start again.

The monitor does include a set of preset modes that automatically match the standard outputs from most graphics cards and, Sony recommend setting your graphics adaptor to the highest refresh rate to get the most out of their monitor.

As with the Mitsubishi, there are two very fine lines on the screen. Again, after a couple of hours use, your brain gets used to them and never notices them again, for some bizarre reason.

What can I say – I've got to have one.

PCPlus Verdict

SONY MULTISCAN 200

✓FOR
→ Brilliant design the best Trinitron screen I've seen

✗ AGAINST
→ At £240 you must be joking

Specification	9
Quality	9
Performance	9
Value for money	10
OVERALL	**10**

Viewsonic OptiSync PF77

PRICE £252 **EX VAT** £215 **SUPPLIER** Viewsonic
PHONE 01293 643900 **WWW** www.viewsonic.com

With digital and analog outputs, this is a versatile monitor with great image quality

Tested on
Matrox G400 on Pentium 500. Digital on nVidia GeForce

This monitor heralds a new generation of monitor development. Most graphics cards have an analog output; this information has to be converted from the digital signal produced by the computer before being sent to the monitor. The PF77 has two separate inputs; one can be used with the standard type of D-SUB connector found on most graphics cards and the other is used for direct digital connection to your PC. In order to make this type of connection you'll need a graphics card with a digital output. Several new cards come fitted with this style of connector.

On test the monitor produced quality results with the standard analog output but using digital removes all the areas of incompatibility between analogue signals and the monitor, producing noticeably improved results. Installation uses a driver disk supplied by Viewsonic.

The PF77 has classic OSD settings controlled by four buttons on the front of the screen. Most of the standard adjustments are available and Viewsonic has included several sophisticated features. You can adjust horizontal and vertical convergence for accurate colour alignment. Remove any image distortion in both planes with symmetry controls and adjust focus for optimum sharpness. They even have a corner pin adjustment that Viewsonic call Hooking.

In use, the PF77 produced good colour rendition with accurate reproduction and full saturation. The screen coating reduced the level of reflection considerably and with the flat screen makes this a joy to use. With dual inputs it would be possible to connect a couple of PCs to this monitor provided one has a digital video card and switch between them. This is a comfortable monitor to work with and If you earn your living stuck in front of a screen all day then anything that helps reduce eye strain has to be a bonus. With the dual inputs you'll be set up and ready for any digital developments in graphics cards.

PCPlus Verdict

VIEWSONIC OPTISYNC PF77

✓FOR
→ Both digital and analog inputs with great image quality

✗ AGAINST
→ To get the best you'll need a digital graphics card

Specification	9
Quality	9
Performance	8
Value for money	9
OVERALL	**9**

Monitors head to head



Manufacturer	ADI	Eizo	Hansol	Iiyama
Model	G910	FlexiScan T561	900P	S900MT1
Tel No	020 8327 1900	01483 719500	01252 360400	01438 745482
Price / Price exclusive	£404/£345	£387/£329	£250/£213	£246/£209
Web	www.adieurope.com	www.eizo.co.uk	www.hansol.co.kr	www.iiyama.co.uk
Max Recommended Resolution	1,792 x 1,344 @ 75Hz	1,600 x 1,200 @ 75Hz	1,600 x 1,200 @75Hz	1,600 x 1,200 @ 75Hz
Scan Frequency V Hz	50-160	50 – 160	47 – 150	50 – 160
Dot Pitch mm	0.24	0.25	0.26	0.26
Tube size diagonal inches	19	17	19	19
Measured Screen Diagonal inches	18	15.8	18	18
Warranty	3 years	3 years	3 years	3 years
VERDICT	**8**	**9**	**8**	**8**



Manufacturer	LG	Mitsubishi	NEC	Nokia
Model	StudioWorks 912U	Diamond Plus 91	MultiSync FE750	446Pro
Tel No	0870 6075544	01707 282837	0845 1219200	0800 833648
Price / Price exclusive	£298/£254	£367/£313	£316/£229	£428/£365
Web	www.lgelectronics.co.uk	www.necmitsubishi.com	www.necmitsubishi.com	www.viewsonic.com/europe
Max Recommended Resolution	1,600 x 1,200 FST 85Hz	1,600 x 1,200 @75Hz	1,600 x 1,200 @73Hz	1,600 x 1,200 @ 85Hz
Scan Frequency V Hz	50 – 200	50 – 140	55 – 160	50 – 150
Dot Pitch mm	0.26	0.25	0.25	0.24
Tube size diagonal inches	19	19	17	19
Measured Screen Diagonal inches	18	18	16	18
Warranty	3 years	3 years	3 years	3 years
VERDICT	**9**	**9**	**9**	**8**



Manufacturer	Philips	Samsung	Sony	Viewsonic
Model	107T	SyncMaster 900SL Plus	MultiScan E200	OptiSync PF77
Tel No	01756 702892	0800 521652	0990 424424	01293 643900
Price / Price exclusive	£222/£189	£363/£309	£241/£205	£252/£215
Web	www.pcstuff.phillips.com	www.samsungelectronics.co.uk	www.world.sony.com	www.viewsonic.com
Max Recommended Resolution	1,280 x 1,024 @ 89Hz	1,600 x 1,200 @ 76Hz	1,600 x 1,200 @ 75Hz	1,600 x 1,200 @ 75Hz
Scan Frequency V Hz	50 – 160	50 – 160	48 – 120	50 – 180
Dot Pitch mm	0.25	0.26	0.24	0.25
Tube size diagonal inches	17	19	17	17
Measured Screen Diagonal inches	16	18	16	16
Warranty	3 years on site	3 years	3 years	3 years
VERDICT	**8**	**8**	**10**	**9**

PCPlus VERDICT

Twelve 17- and 19-inch monitors were tested, all of which were of a high standard, but they couldn't all be award winners. Which were the best monitors? We reveal the best options available

Analysis

Summing up

No manufacturer is going to bring a new monitor onto the market place that's no good (hopefully), especially with the range of sizes featured in this review.

As a result, none of the monitors that I've had the chance to look at this month would disgrace your desktop. Some of the reviewed monitors have exceptional quality and it's amongst these that I've managed to find the Editor's Choice and Performance awards. When two units have equivalent optical performance then design, price and optional extras will influence the final decision. When it comes to the value awards, price is obviously the main criteria but not at the expense of quality. So a value award means that you're getting a good quality product at a very reasonable price.

You will see from the results table that the majority of this month's monitors have very similar specification on screen resolution and scan rates. This does restrict quantitive evaluation as no one monitor has a clear advantage in this area. Latest digital developments may change this in the near future but, for the moment, assessments rely heavily on qualitative impressions (that's how nice they look).

I've attempted not to let my own personal preferences influence the awarding too much and take each monitor as I find it. They have all been tested under the same ambient lighting conditions and the same graphics card has been used to maintain a uniform environment. However, there was one exception, this being the digital monitor (the Viewsonic OptiSync PF77) that was viewed with both the standard Matrox card and an nVidia card with digital output. Other than this one exception, all testing is equal.

EDITOR'S CHOICE

Sony MultiScan E200

PCPlus EDITOR'S CHOICE

PRICE £241 **EX VAT** £205
SUPPLIER Sony
PHONE 0990 424424
ONLINE www.world.sony.com

If the Sony monitor had been a car it would probably have been designed by Porsche. The general build quality is exceptional and allied with the simplicity of design it is a joy to use. Image resolution and colour rendition are excellent across the range with 0.24mm dot pitch this is one of the best Trinitron tubes that I've come across. The ability to adjust just about everything with one finger under the bezel is great.

The case is compact for a 17-inch monitor and won't look out of place in any situation. To get this level of design and performance in one monitor is great but, to get it at this sort of price is stunning. It has to take first place and is, without any doubt our Editor's Choice.

PCPlus Verdict.....10/10

BEST VALUE

Hansol 900P

PRICE £250 **EX VAT** £213
SUPPLIER Hansol
PHONE 01252 360400
ONLINE www.hansolel.co.kr

Hansol don't make cheap monitors! This may sound odd as they've just won our Value award. No, this is a good monitor at a very good price. It may not quite achieve the resolutions of some of the more expensive flat screen monitors but this is a quality screen. To bring a 19inch monitor with this sort of specification to the market place at just over £200 is extremely impressive and they must take our value award.

PCPlus Verdict 8/10

BEST PERFORMER

NEC MultiSync FE750

PRICE £316 **EX VAT** £229
SUPPLIER NEC
PHONE 0845 1219200
ONLINE www.necmitsubishi.com

At the level of performance I've found amongst the monitors in this roundup it's hard to single out any one as 'First amongst Equals.' However, the NEC MultiSync FE750 brings NEC right back to the forefront of monitor design. In many ways it's a qualitative choice. However, despite all the competition from the other monitors, I felt that the NEC just piped them on pure image quality and takes our performance award.

PCPlus Verdict 9/10

PCPlus HELPDESK

We solve your PC problems

Who's recording your every move on the Internet and marrying the data with your personal details? In this month's **HelpDesk** I show how a packet sniffer can help catch the snoops red-handed.

Learn how to remove a gone wrong DirectX upgrade, defrag faster, synchronise the clocks of networked PCs and Discover how to use spreadsheets to analyse National Lottery results - is the obvious winning strategy a loser?

If you need to print repeating elements, such as, business cards or complements slips,there's a great set Word 2000 tools to help.

Keep those questions and suggestions coming, but please note that I can answer the ones chosen for publication.

Ian Sharpe/HelpDesk Editor
ian.sharpe@futurenet.co.uk

Write in!

E-mail your questions to:
ian.sharpe@futurenet.co.uk

Or write to: HelpDesk, PC Plus
30 Monmouth Street
Bath BA1 2BW

Or fax: 01225 732295

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When you see this, visit the Web site for more information, advice or support

Help us help you!
We get thousands of e-mails a month so do please send your mails to the right department. If you are having CD problems e-mail **pcplus.support@futurenet.co.uk**.

WORD

PCPlus SUPER DISC \prog\files\helpdesk

Replicating table cells

Q **Can you supply me with half an answer? (I already worked out the other half). I want to print short runs of business cards and compliments slips on a laser printer using Word 2000. As several copies of a card or slip will fit on a sheet, it seemed easiest to cover the page with a table.**

Each cell contains one card or slip. The document for the cards has a page covered with a 2 x 5 table, while the slips are in a 1 x 3 table. Having edited a design in one cell, I needed an easy way to copy it to all the other cells. To do this I recorded a macro as follows:

Select the current cell (Table / Select / Cell); Press [Ctrl][C] to copy it; Select entire table; Press [Ctrl][V] to paste.

Word fills all the cells with a copy of the cell containing the insertion point. I assigned the macro to a button on the Tables and Borders toolbar.

When you are fiddling with a design and printing off samples, a lot of toner is wasted if the rest of the page is filled with the old design. It does not seem possible to record a generic 'clear all cells but this one' macro which doesn't care about the table size or which cell contains the insertion point. Can you solve this?
Ronnie Morgan

A Yes, we can do that, and also upgrade the macro you have already created.

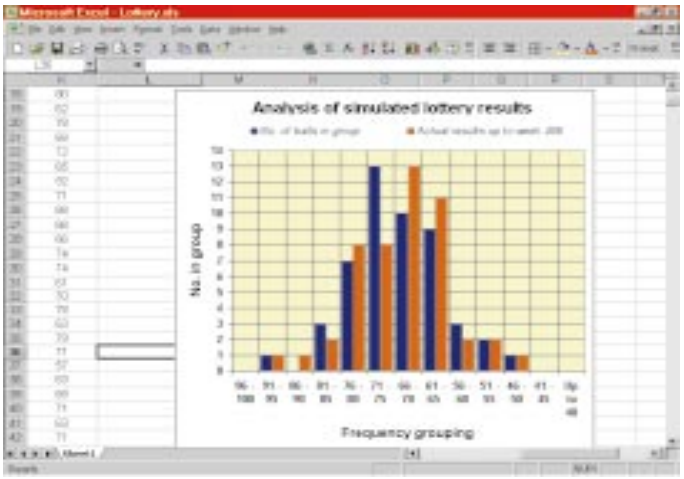
Your macro has a small drawback in that it only operates on the first table in the document. If you decided to put more than one item of stationery in one file, for example cards for different people, then the macro would not operate on the second or subsequent tables.

One click is all it takes to fill the entire table with copies of the current cell, or to depopulate it back down to a single copy.

My version works in any table but note that, like yours, although it works on all objects within a cell including graphics, it won't work if a graphic object is selected when you run the macro. This is a limitation of Word and is easily avoided. Neither will it work if the selection extends over more than one cell.

My 'clear all cells but this one' macro works copies the contents of the cell containing the selection point, wipes the entire table, then pastes the cell back into place. There are probably other ways to code it, but this must be about the simplest. It ought to work reliably, but if something does go wrong and you're left with an empty table, remember that you can manually paste the copied original from the clipboard.

Both macros are in the file TableMacros.dot and require Word 2000. They will fail with earlier versions. Copy the file to your hard disk and go to Tools / Templates and Add-Ins. Click Add and then browse to TableMacros.dot. Select it and click OK. Turn on the Tables and Borders toolbar. Right-click it and select Customise. On the Commands tab scroll down the Categories list to Macros. Drag TemplateProject.Table Macros.TableFill withThisCell and .TableClearAllButThisCell from the command list to the toolbar. Right-click each one in turn and edit the names down to something more manageable. Close the dialog.



↑Lottery.xls illustrates that the National Lottery results so far are consistent with an unbiased draw.

EXCEL

PCPlus SUPER DISC \prog\files\helpdesk

Losing the Lottery

Q **Can anybody help us to make an Excel document which will pick the six most common numbers from a series of past lottery draws?**
John Tynan

A This question made its first appearance in issue 125 and the guy who asked still hasn't sent my cut of the winnings. What could be the reason, I wonder?

The analysis is freely available on the Net – http://lottery.merseyworld.com/Analysis/ is one of many examples. This is a strong hint that if the top six numbers do all come up in one draw, so many other people will have chosen them that the prize will be split thousands of ways.

Furthermore, if it could be proved that there is no significant bias in the Lottery draw, you could be sure that this set of numbers is no more likely to come up than any other set, no matter what the past performance.

If there is no bias, your choice of numbers does not increase the chance of winning, yet it reduces the pay-back if the gods do smile on you. We'll come back to this later.

Off to one side of the list where there is some free space, enter two column headings, 'Ball' and 'Frequency'. In the Ball column build the list 1 – 49. The easy way is to enter '1' into the first cell (press [Return] then move back on to it). Go to Edit / Fill / Series. 'Series in' should be set to 'Columns' and 'Type' should be 'Linear'. The step value should be 1 and the stop value 49. Click OK. In the cell to the right of '1', enter:

```
=COUNTIF(
```

Follow this with the address of the range containing the results. Each cell reference must be made absolute by prefixing each row and column index with a $ symbol. This is so that when you copy this formula down the list, Excel doesn't adjust the range address.

Now type a comma, followed by the address of the cell containing the '1' (no dollars required). Close with a ')' and press [Return]. Here is an example – your addresses will probably be different:

```
=COUNTIF($B$2:$G$400, I2)
```

Assuming cell I2 contains '1', this will count all the '1' balls in the range B2 to G400. Select this cell and double-click the small black box on its bottom right-hand corner – the mouse pointer turns into a cross – to copy the formula down the column as far as '49'.

You now have a list of counts, but not in order. Highlight the range of ball numbers and frequencies and use Data / Sort to sort them into descending order of frequency. This brings the most popular numbers to the top.

As new lottery results are entered you will have to extend the range in the formula, re-copy it, then re-sort.

You can avoid changing the formula too frequently by extending the range way beyond the latest results, so the analysis takes in blank rows that have yet to be filled. Put a reminder in the row after the last one in the range to tell you to update the formula.

One way to make the process less troublesome is to give a name to the range being analysed (Insert / Name / Define). This name can

PHOTODRAW

Effects for free

PhotoShop compatible plug-ins on the Web

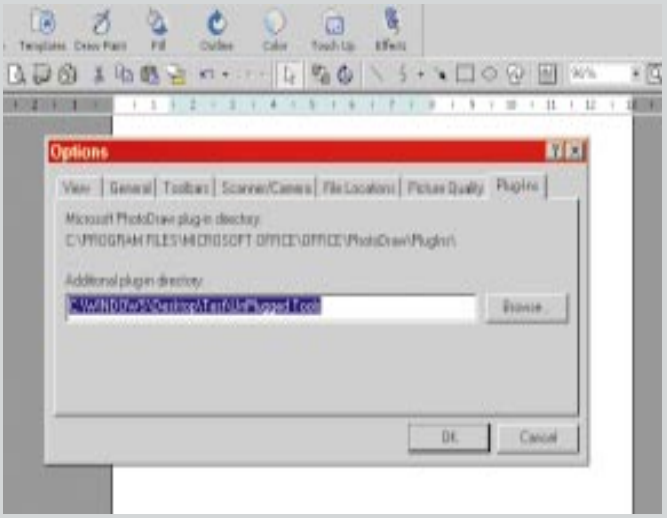
Q **I wanted a graphic of a CD for my newsletter and attempted to draw one with MS PhotoDraw 2000. I was never much good at art, and Microsoft's finest hasn't changed that one iota. Eventually I decided to look for a free piece of clipart and asked in a newsgroup if anyone knew where I could get what I was looking for.**

One of the answers revealed a side of PhotoDraw I didn't know about and which I am sure will interest other users... plug-ins. These are programs which integrate with PhotoDraw and add new features. It turns out that PhotoDraw accepts many PhotoShop-compatible plug-ins, and there are many available on the Net.

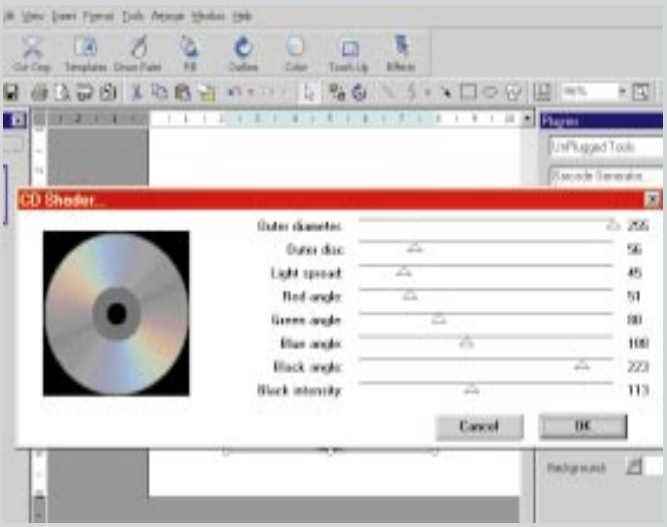
Somebody directed me to a free set of plug-ins called UnPlugged at www.v-d-l.com/up.html. It gives 100 new effects including one to produce a convincing CD.
Mark Dalton

PhotoDraw plug-ins

PhotoShop compatible plug-ins, like PhotoDraw, make graphic art an easier task and are available on the Web



1 To install plug-ins, create a folder to keep them in, copy the files there and point PhotoDraw at it from Tools / Options / Plug-ins.



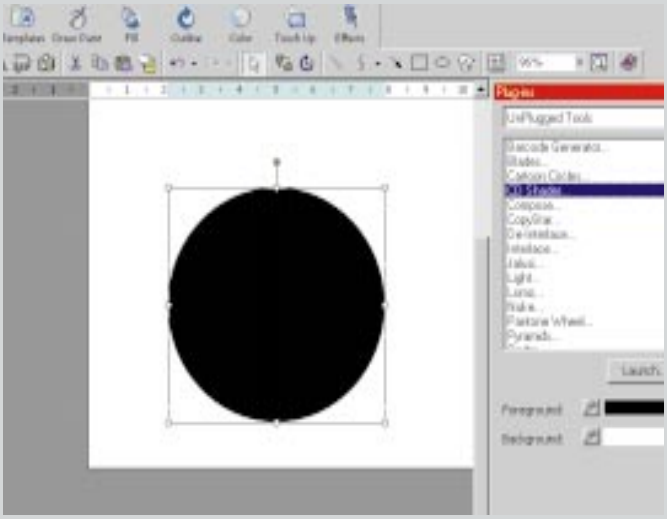
3 Choose the one you want and click Launch. The plug-in may have its own interface where you can change the options.

A PhotoDraw isn't the only program to accept PhotoShop plug-ins. Check your paint program's documentation to see if it does too. Also see the compatibility list at www.v-dl.com/up_comp.html.

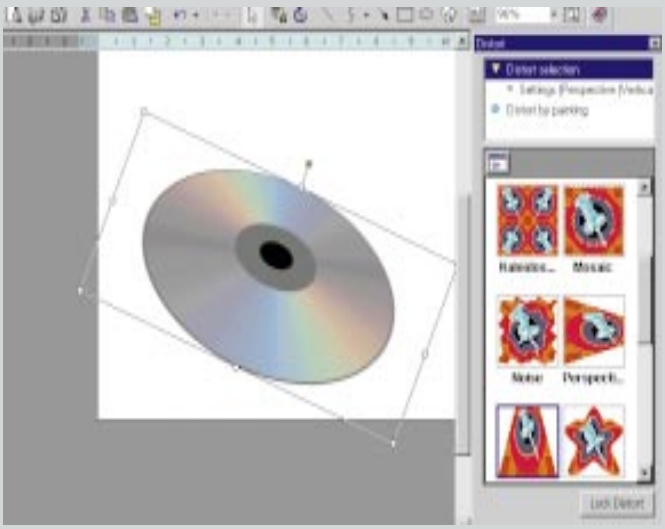
I must confess I'd never tried a plug-in before. I downloaded the ones you mention and I've now woken up to this. The walkthrough shows how easy it was to install a plug-in and produce the CD graphic.

You can find other plug-in collections at various places on the Web. Go to any decent search engine and specify 'PhotoShop plug-ins'. You will get several pages of results. It's worth sampling a few to get feel for what's on offer – they could save you a lot of work in the long run.

Programmers interested in writing their own plug-ins should start at www.adobe.com/support/downloads/pswin.htm where the plug-in SDK can be downloaded. It requires Visual C++ and it's weighty old read. If you aren't a C++ programmer, systems such as FilterMeister (www.filtermeister.com) enable you to create plug-ins using a simpler scripting language.



2 Draw a shape and fill it with solid colour. Click the Effects button, then Plug-ins, and the available tools are listed on the right.



4 After adding perspective distortion and tilting the graphic, we have a flying CD. All in all, about a minute's work.

then be used in place of the range address:

```
=COUNTIF(WinningNumbers,I2)
```

When the data set grows beyond the bottom of the named range, all you have to do is edit the name's specification in order to extend its scope. This removes the need to change the Countif() formula. You could automate the housekeeping tasks and the weekly re-sorting by way of macros and buttons, but that's another story.

You now have the answer to your question, but let's go a bit further and see if we can get a clue as to whether the Lottery draw is exhibiting bias. After nearly 500 weeks the most popular numbers have come up almost twice as often as the least popular. Surely this is an indication that the top numbers are more likely than others to come up in the future?

It's tempting to think so, but look a bit deeper and you'll find good reason to doubt this notion. If the draw is genuinely random, each number has an equal probability of being selected. Yet as the results accumulate, there is still bound to be some variation in the frequencies with which various numbers come up.

The question is, do the results so far come close to what you'd predict for an unbiased draw? This isn't the place to explore statistical analysis, so let's take an experimental approach.

The distribution of frequencies can be analysed with Excel's Frequency() function. First, we iron out minor variations by grouping the frequencies into ranges. An interval of five seems to be suitable. What we're counting now is the number of balls that came up between 46 and 50 times, the number that came up between 51 and 55 times, and so on.

In another column enter a list of intervals. I suggest values of 100, 95, 85 and so on down to 40. Select the blank cell to the right of 100 and then highlight the column of blank cells beneath it down as far as 40. Click in the formula bar and enter:

```
=FREQUENCY(range1, range2)
```

Change 'range1' to the range address containing the frequencies generated by Countif(). Change 'range2' to the range containing the interval values. This is an array formula, so don't press [Return] to enter it. Press [Ctrl][Shift][Return].

The formula should appear within curly brackets and the results be placed in the highlighted cells. See issue 167's **HelpDesk** for an explanation of array formulae.

By itself, this distribution doesn't tell you much. But, run the same analysis on random numbers generated by Excel and you will get a similar distribution. Do it as many times as you like, and most of the time the distributions broadly correspond – the top-ranked numbers come up about twice as often as the ones at the bottom, with a characteristic bunching of results around the average frequency.

This is an indication that the Lottery is probably behaving as it should do and that the top-ranked numbers are put there by the vagaries of chance. That being the case, if you were to analyse the results of the next 500 draws, a different set of numbers would be favoured to the same extent as the current leaders.

On this month's **SuperDisc** there is the file Lottery.xls, which illustrates everything covered here.

DELVING DEEPER

A faster Defrag

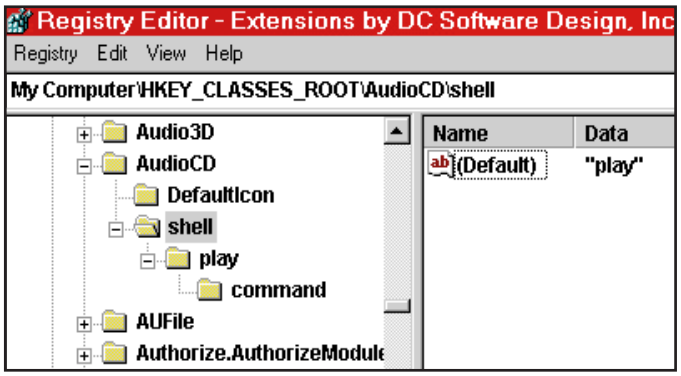
Hasten the defragging process without using Explorer

When Philip Kwong sent me an e-mail about Power Defrag, a defragmentation aid available from www.e-technik.com, I was a little dubious. The text on the site doesn't inspire confidence and I half expected my hard disk to die a horrible death at the hands of the program. I gave it a whirl anyway, and it's actually pretty useful.

Power Defrag is for Windows 98 and uses the standard Microsoft defragmenter. It claims to hasten the defragging process by rebooting Windows in a stripped-down configuration without using Explorer as the shell. This leaves more memory and fewer background tasks. After Defrag has finished, Power Defrag automatically reboots and puts things back as they were.

I can't vouch for the speed increase because I haven't run comparative tests. It seemed quick, but the real benefit for me is that it solved the persistent problem of Defrag restarting part way through. Our previous easy fix was to reboot Windows into Safe Mode and defragment from there.

This usually works, but disk access is a lot slower and the process can take hours on a big partition. Power Defrag cut out whatever background program was interrupting Defrag, but without the speed hit of Safe Mode. You do lose the special application optimisation feature introduced in 98, however. If you are willing to trade that for quicker (and therefore probably more frequent) defragmentation, this appears to be a good tool and is free at the time of writing.



↑This registry value must be set to 'play' if audio CDs are to auto-play when inserted in the drive.

AUDIO CD

Auto-play won't work

Q **I think I have a problem with the auto-play function with Windows 98 CD Player. I believe that when I insert an audio CD, say, it should automatically play. I have gone through Folder Options in My Computer and set the file type details of AudioCD to open with CD Player. Now when I enter a CD the most I can get the program to do is to display the program window. I have tried using the Edit function through Folder Options as suggested in the help file but I am getting no further. The PC Plus cover discs auto-play but not audio CDs. Can you help? Gregory Coltman**

A There are two things to try initially. Press [Windows][Break] and locate the CD-ROM in Device Manager. On the Settings tab of its Properties dialog ensure that 'Auto insert notification' is turned on. It most likely will be, because data CDs are auto-playing. However, although auto-insert notification is a prerequisite for CDs to auto-play, it isn't the full story. Windows has two other settings which control it – one for data CDs, another for audio.

The easiest way to get at these is to use TweakUI if you have it, or similar utility. On TweakUI's Paranoia tab is a 'Things that happen behind your back' section, containing two checkboxes: one to make audio CDs play automatically, and the other for data CDs.

These checkboxes change settings in the registry, and if you still can't auto-play audio CDs I would run Regedit and open the branch My Computer \ HKEY_CLASSES_ROOT \ AudioCD \ shell. There should be a (Default) string value set to "play" for auto-play of audio CDs – see the screen grab. Going down to the Play key on the left, its (Default) value should be '&Play'. And the Command key should have a (Default) string value of 'C:\WINDOWS\cdplayer.exe /play %1'.

There is another registry key involved in auto-play: HKCU \ Software \ Microsoft \ Windows \ CurrentVersion \ Policies \ Explorer \ NoDriveTypeAutoRun. Unfortunately it isn't clear what it should be set to as I have seen different values on different machines.

If all is in order in the registry, try typing this command line into Start / Run: cdplayer /play

It should auto-play a CD. If not, I would re-install CD Player from the Windows CD, in case the program file has become corrupted. If the command line works, add the /play switch to the shortcut to CD Player under Start / Programs / Accessories. Beyond that a quick refresh of your Windows installation (install it over the top of itself) may bring relief.

HARD DISKS

Is my drive healthy?

Q **Can you tell me more about SMART for hard disks? I know it is a way of monitoring a drive's health, and the spec sheet for my drive says it has this feature. Is there a way to keep an eye on what SMART is finding, or will I just get a warning when it detects something going wrong? I use Windows 98. Steve Napier**

A SMART stands for Self-Monitoring And Reporting Technology and enables a drive to monitor certain indications of developing faults. To make use of SMART you may find that support has to be enabled in the BIOS set-up screens. Additionally, a driver is required to allow the data to be read. Microsoft supplied one with Windows 98 and 95 OSR2. It's the file Smartvsd.vxd. and must be located in Windows\System\Iosubsys. It's possible you will have to move it there from another folder.

This driver enables applications to read SMART data from suitably equipped IDE drives. Without such an application you will get no warning of trouble and there is no way to see what's happening. There isn't a suitable program with Win95 OSR2 or Win98.

Norton Smart Doctor (part of Norton Utilities) is one option.

Intelli-SMART from www.lc-tech.com is another – there's a 15-day trial version, but before the company parts with it you are required to hand over more personal information than you might care to give.

At www.storagesoft.com/support/updates.asp you can buy EZ-SMART for $30, but there's no trial version. At www.storage.ibm.com/techsup/hddtech/welcome.htm is EZ-SMART5.0.24.IBM.exe, a version of EZ-SMART intended for people who bought IBM drives. It recognises my Seagates and my Quantum, but it's hard to say whether it has been nobbled to only give full functionality on IBM drives.

One further option is SmartMon from www.santools.com/smart/eval.html. There is a 30 day trial edition.

SMART won't enable software to predict all kinds of failure. When monitored, it reduces the risk of being caught out but doesn't remove it altogether.

PCPlus SUPER DISC \prog\files\helpdesk

SCANNING

Exploit the start button

Q **Although I will probably be the first of many people to point this out, in issue 168 of PC Plus, in the box-out An update on Windows Scripting, the code printed won't work because on the fifth line the text says:**

```
eateObject("WScript.Shell")
```

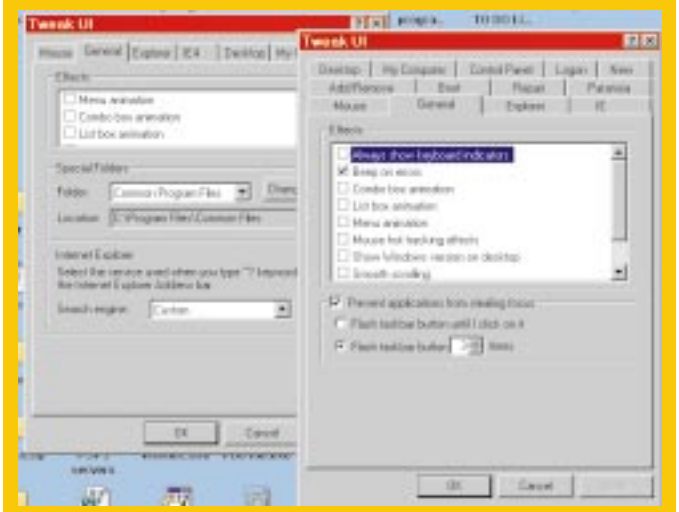
and not:

```
CreateObject("WScript.Shell
")
```

DELVING DEEPER

TweakUI 2000

Set for release in September



↑An old favourite taught new tricks. The beta of TweakUI 2000 (right) brings the interface tweaking tool into line with the latest versions of Windows.

It was on then it was off and now it's on again... allegedly. Microsoft released a time-limited beta of TweakUI 2000, but then announced that there would be no final release. Somebody discovered how to hack the beta to remove the time-out. At the time of writing, the hacked version is available from www.windows-help.net/windows98/download.shtml.

Soon afterwards Microsoft announced it would go ahead with TweakUI 2000 after all. Some behind-the-scenes arguments over that one, methinks. It should be out mid-September if the plan doesn't change again. That's a month after I write this so I can't give you a URL – do a search at www.microsoft.com or one of the third-party Windows sites.

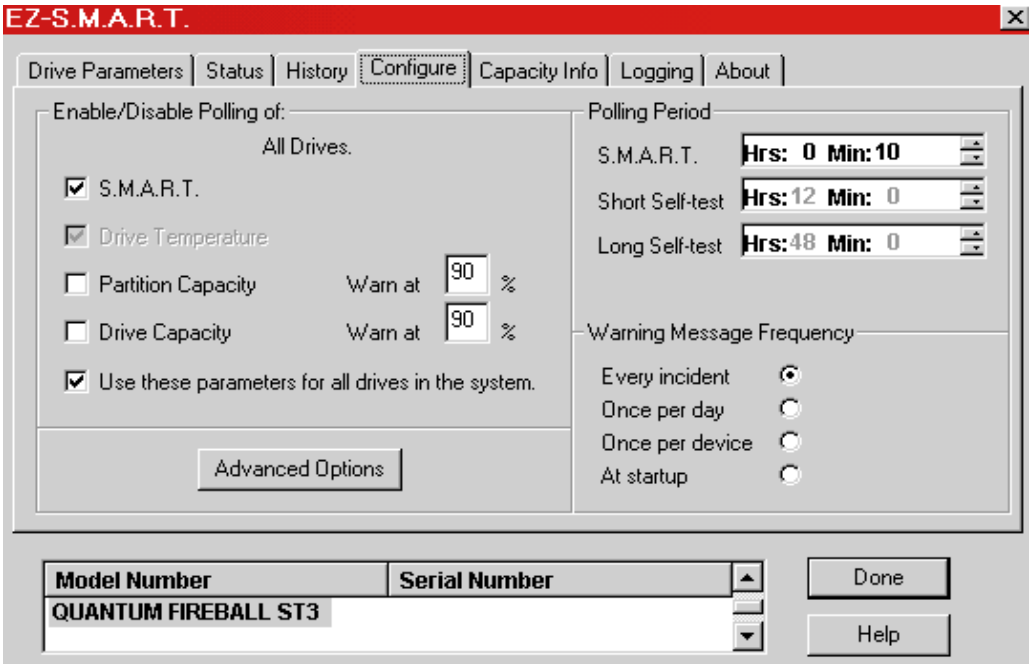
The beta is Windows 2000-aware, sprouting new options when it detects itself running on that OS. It's also compatible with Win95, 98 and Me, though the earlier the version of Windows the less there is to be gained by installing it. TweakUI 2000 has a similar presentation and mostly the same options as the previous incarnation, but with a sprinkling of new tweaks too where the operating system supports additional features – see the screen grab for a foretaste.

The first line also says 'named rinter', but obviously that doesn't matter, seeing as it's a comment! At least the version on the **SuperDisc** is okay.

I recently discovered the WSH, and installed it for use with with my scanner. For some reason, the start button on my Epson GT7000 only launched either Imaging for Windows or the supplied Page Manager software by default, and there's no obvious way to add other programs to the options list, probably because no other program can be set up to scan via command line parameters.

After a little searching in the registry (via Regmon, mentioned in **HelpDesk** several months ago), I found the program list and added the command line of a Windows Script to it. This script launches PSP, and then (via the SendKeys method) selects the Acquire option from the File menu. It now works perfectly, although I'd like to add a feature where it launches a different program depending on how many times the button on the scanner is pressed. Is this possible with WSH?

Since you didn't print it in the magazine, I don't know if you know about the reference on the WSH available on http://msdn.microsoft.com/scripting/ which is downloadable and contains all the methods, properties etc in WSH.



↑Is your hard disk heading for disaster? SMART monitoring software can predict when the end is nigh (sometimes).

The VBScript reference on the same site contains details of the FileSystem object, which can be used to do many of the things that batch files can in DOS (and some of the things that they can't). Andrew Howlett

Sorry about the error – the missing characters went AWOL somewhere in the production process. I did know about the documentation but other readers may not, so thanks for the reminder.

You have uncovered part of the mechanism by which Windows responds to a USB still-image device's start button.

A program called Stimon.exe (Still image monitor) sits in memory watching for the device driver to signal that the button has been pressed. Stimon then looks in the registry, in HKEY_LOCAL_MACHINE \ Software \ Microsoft \ Windows \ CurrentVersion \ StillImage \ Registered Applications, to find out which programs are registered as image acquisition handlers. If there's more than one, the list is presented in a dialog box for you choose, or it is launched directly.

All the program command lines have a feature in common – they are suffixed with a pair of switches:

```
path\to\someprogram.exe
/StiDevice:%1 /StiEvent:%2
```

These are a generic link to client applications. To add new applications to the list, try following the same style. The switches definitely won't work if you add them to a command line in the Start / Run dialog, because %1 and %2 are placeholders for data which is filled by Stimon. For instance on my system, when I press the button and choose an application, the switches become:

```
/StiDevice:Image\0000
/StiEvent:{7d245e24-56c0-
11d1-bed9-00aa002f3325}
```

The information after the colons may be different on your computer. If you can find the data being passed to the application in the %1 and %2 positions, you can set up shortcuts which invoke applications in image acquisition mode, as if you'd pressed the start button.

To discover the command line arguments you could use a batch file, but it's easier with the program 'Command line peeker.exe', which you will find on the **SuperDisc**.

Once installed, copy the EXE file to the same folder as the program you want to check. Rename the original program's EXE file – just stick an underscore on the front – then rename mine to that of the original. Command Line Peeker will now be invoked instead of the usual application. When run, it just displays the command line arguments. You can copy them to the clipboard by selecting all the text and pressing [Ctrl][C].

Not all computer programs are written to respond to these command line switches, but you should give this way a go before resorting to a script.

The idea would be to rip out all the other registered applications so that the start button caused a script to be launched immediately. If the script hung around for a second or two to watch for any further instances being launched, note them and close them down, you could cobble up a 'one press for program A, two presses for program B' system.

However, for me the button response time is a second or more and there's no buffering, so it's no good for rapid-fire clicking.

Reader Tip

News reader tune-up

Clean up old news

I keep several month's worth of newsgroup messages in Outlook Express as they are an invaluable resource which I search and browse as a means of problem solving and learning new things. My OE file is something like 40MB in size and had become slow to work with. Clicking on a newsgroup would cause several seconds' delay while the program collected all the message headers from around the file.

My tip is that under Tools / Options is a Maintenance tab with a 'Clean Up Now' button – at least there is in OE5. The main purpose of this is to close up gaps left by deleted messages, but the process seems to re-write the message file. A by-product of this appears to be to rearrange it internally so that messages in the same group are placed together. At least the stickiness has all but vanished now.

Gareth K

UPDATE

Listing unique items in Excel

By using Advanced Filter, multiple instances become one

Several readers sent alternative solutions to Landon Hughes' problem in issue 167. Landon's question concerned listing every item contained in a list where there were multiple instances of some entries – such as Jack, Jill, Jill, Jack, Arthur. How do you make a copy of the list containing only Jack, Jill and Arthur?

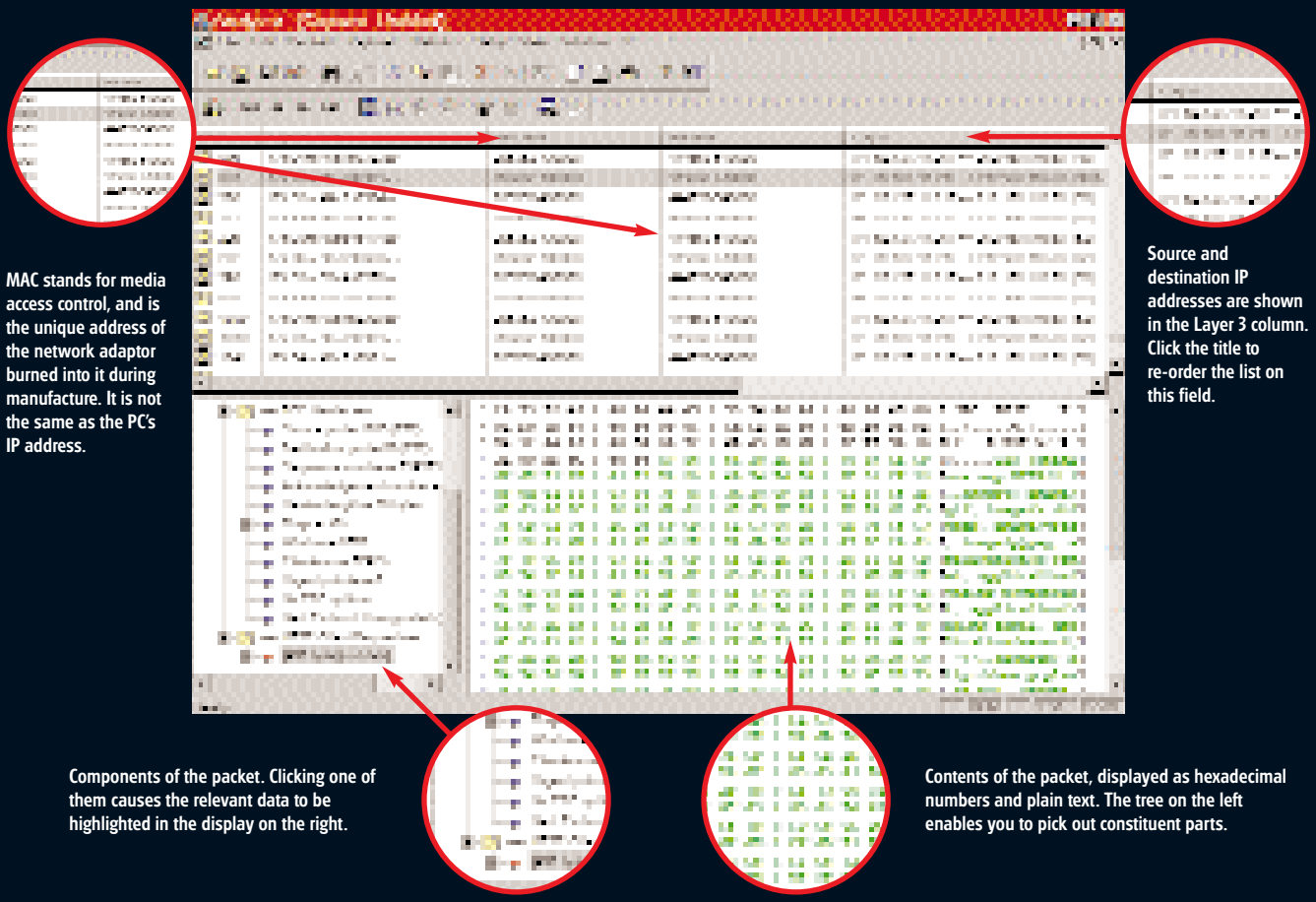
I found three ways. Others came up with two more which have the virtue of being quicker. These may not work in early versions of Excel.

A few readers proposed that Landon uses a pivot table, but the most popular suggestion is probably the easiest: the Advanced Filter option under Data / Filter. You must first highlight the list, which must include a heading in the first cell. In the Advanced Filter dialog you tick the 'Unique records only' checkbox. You can also opt to copy the filtered list to another location.

BEST PRACTICE

Anatomy of a packet sniffer

Use a packet to show all data displayed as both plain text and hexadecimal numbers



INTERNET

I spy...

Q **After reinstalling Windows from scratch I was reinstalling my regular utility programs. The addition of one of them prompted the reappearance of an annoyance that had been present for some time: every time Windows starts, I am prompted to connect to the Internet.**

Further investigation lead to the discovery that the program installs a system by a company called Aureate. I am told this manages the adverts displayed in the program, and the advertising revenue enables the authors to distribute the software free of charge.

Fair enough, but scouting around the newsgroups and the Web revealed plenty of references to 'spyware' and how the Aureate system, and similar software, sends your personal details back to the spyware company and also logs your activities on the Net so they can track where you've been, which programs you downloaded and so on.

Aureate itself – now called Radiate (www.radiate.com) – denies these allegations. Is there any way I can test Radiate's claims? And even if Aureate/Radiate is telling the truth, how can I know whether ad-supported software using other companies' systems isn't doing something I won't like? David Norris

A You are right to be concerned. The Internet is frontier country and, like the Wild West, people are constantly testing the bounds of what can be got away with.

Spyware suddenly became a hot story when Aureate/Radiate appeared on the scene, and public and media pressure forced the company to behave in a more reasonable and transparent manner. Recently the issue blew up again in relation to the NetZip Download Demon, RealNetworks RealDownload and Netscape/AOL Smart Download utilities. A detailed and disturbing exploration of what these programs got up to can be read at http://grc.com/downloaders.htm.

Many people avoid ad-ware altogether. The downside is that they could be missing out on good software that uses a perfectly acceptable advert management system without infringing privacy. Neither does avoidance prevent somebody sneaking a nasty monitoring system into a program which isn't obviously ad-ware.

A firewall may help you spot suspicious-looking network activity, but it probably won't tell you what's really happening. If you want to examine the traffic over your Internet connection, what you need is a packet sniffer. This is a program that logs a copy of incoming and outgoing network packets. You can page through them at your leisure, looking for unexpected activity and examining the data being carried.

There are sniffer tools galore for Windows, DOS and Unix at http://packetstorm.securify.com/sniffers/indexdl.shtml. A long way down /sniffers/sniffing-faq.htm are links to

UPDATE

MBRWork URL correction

Rescue utility unreachable due to caps switch

The URL we published for MBRWork, the rescue utility mentioned in issue 168, proved unreachable because the server is case-sensitive and we got our caps switched. You need to go to www.terabyteunlimited.com/FREESTUF.HTM, not freestuf.htm or any other variation. Bruce Ella was the first of many to point it out.

others. Yet more packet sniffing resources are to be found at http://grc.com/oo/packetsniff.htm.

As is pointed out on the PacketStorm site, sniffers have legitimate and illegitimate uses. Essentially you can eavesdrop on all the packets that pass by your machine on a network, whether or not they are intended for you. Good for network administrators tracking down problems, but the security risks are clear. If I were caught using one unauthorised on a company network, I think I could reasonably expect to be invited to further my career elsewhere.

I downloaded Analyze.exe from PacketStorm, along with the driver from the author's site. When installing the driver I had to repeat the process for each adapter (the network card and the dial-up adapter). The software will find an adapter which doesn't already have the packet sniffer driver bound to it, and attach itself.

After that I was able to run Analyze.exe, choose an adaptor, and set it logging. You don't see the packets in real time – you tell Analyze to stop logging, after which it organises everything for display.

What then? A mountain of information is presented and you could spend half your life searching for evil. One way to cut it down to manageable proportions is to re-order the data on the Layer 3 field which shows the source and destination addresses. This way you can home in on outgoing packets (your own IP address will be on the left) and the destination addresses will fall into distinct blocks.

If all you did was browse a couple of Web sites, you can use the PING command from an MS-DOS Window to translate their URLs into IP addresses. You can then ignore these in the list and focus on addresses which do not seem to tally with the sites you visited. If required, a program such as Sam Spade (www.samspade.org/ssw/) can help you find out who owns these addresses.

As you scroll through the unknown destination addresses, you can see the packet contents as hexadecimal and ASCII. Drag the pane divider to the left if lines of the hex/ASCII display are broken up. Part of a packet is addressing information; only some is actual data. Analyze's lower-left window has a data option which, when selected, will highlight the segment.

You may see requests to Web servers, your side of the dialogue between your PC and mail and news servers, and also the requests for banner graphics from advertisement servers.

Watching for these lets you identify the addresses the ad-ware computers are operating at. You can then examine those packets in more detail, watching for personal information. This might not be plain text, so paging through your packet sniffer log may not make compromising data jump out. The story at http://grc.com/downloaders.htm will give you an insight into the sort of thing you would have to look for.

What you can do then is define a filter which, for example, only traps packets going to particular addresses. This cuts the data overload and lets you see the dialog between your computer and the suspect system more clearly.

I won't pretend it's an easy business, and to do it effectively you would have to educate yourself on the workings of TCP/IP and probably have a technical background.

If you want to check whether you have known ad-ware installed, in addition to the free OptOut program at the Gibson Research site, there is a program called Ad-aware at www.lavasoft.de which a lot of people are raving about.

ACCESS

What's my age?

Q **I am setting up an Access 2000 database to keep a list of personal details including birthdates. How do I get it to record, display and update a person's age?**
Brian Hollis

A What you don't do is have a field in which you manually enter the age. If you did that, you would have to come up with a way to update the age field every time the table was opened, or the clock struck 12 when it was already open. This is technically possible, but a very clumsy way to handle the problem.

It also be a waste of space because you're holding the same information twice – given that the computer knows today's date, the age can always be calculated from the birthdate.

One approach is to create a user-defined function which, given a date, returns the age in years. This function will be usable in filters and on forms and reports. This enables us to easily display and utilise the age without re-typing a long complicated formula every time it is needed – the formula is encapsulated inside the function Age, shown in the panel.

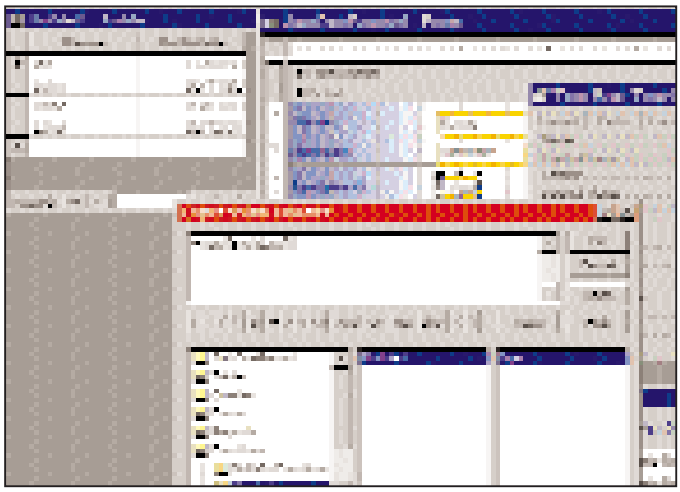
Open the file Access2000Macro.txt from the **SuperDisc**. Copy the macro code from there to the clipboard. In Access, press [Alt][F11] to bring up the VBA editor. On the far left, right-click the name of your data and select Insert / Module. Paste the code into the window that appears on the right. Close the VBA editor.

You will find that the Age function appears in the Expression Builder and can be used alongside the built-in functions. For instance if you have a field called DateBorn, you can specify a filter condition to see the records for people under 40 years of age:

```
Age([DateBorn]) < 40
```

To display the age on a form, in Design mode you can add a text box and, on its Properties sheet, fill in the ControlSet property with:

```
=Age([DateBorn])
```



↑A few lines of Visual Basic for Applications add a valuable new function to Access 2000.

DELVING DEEPER

Access 2000 Age function

This user-defined function enables you to calculate an age, in years, given a birthdate

```
Function Age(Birthdate As Variant) As Integer
  If IsNull(Birthdate) Then
    Age = 0
    Exit Function
  End If
  Age = DateDiff("yyyy", Birthdate, Date)
  If Date < DateSerial(Year(Date), Month(Birthdate),
Day(Birthdate)) Then
    Age = Age - 1
  End If
End Function
```

How it works: The first line tells Visual Basic to expect a variant value to be given (passed) to the function, and that it is to be placed in a variable called Birthdate. Variant is a generalised data type that can store different kinds of data – strings, numbers, dates and so on. 'As Integer' says that the result of the function will be a whole-number value.

The user may not have entered data into the field whose value is being given to the Age function, so we must check the Birthdate variable with the IsNull function. Execution of Age only continues if Birthdate contains a value. IsNull only works on variants, which is why Birthdate was not declared as a date.

The DateDiff function calculates the number of time periods between two dates. Specifying a period of 'yyyy' tells DateDiff to report the number of years. Birthdate is the earlier date; the result of the Date function (today's date) is the later one. So DateDiff returns the number of years between today and the birthdate, and the result is placed in the Age variable.

Visual Basic for Applications automatically creates a variable with the same name as the function. Assigning a value to it is how you return a result that other parts of Access can use.

Lastly, we check whether today's date is before this year's birthday. If it is, we must reduce the age by one. Think about it – this year minus last year is always one, but your age doesn't tick over until your birthday.

Other languages may not allow you to manipulate the value already assigned to the function-return variable. Even though Visual Basic does allow it, purists would probably insist that a temporary variable be declared to hold intermediate results. I didn't get much education so I don't find myself worrying about it.

Reader Tip

E-mail via the Web

Twigger happy e-mail

Q **You may be interested to know about a free service I use to view/delete large messages prior to downloading them. It's at www.twigger.co.uk and all you need to do is select your ISP, enter your standard user name and password, and your mail is available. They support just about every UK ISP too – even my home ADSL HomeChoice account!**
Nik Hunt

A The 'what to do mailbox-breaking messages' question has been covered in considerable detail in previous HelpDesks, but this suggestion is novel and does have other possibilities. Principally, you can access your e-mail account while away from home when it might be difficult from a public-access PC or from abroad. Twigger's Web-based interface enables you to read and reply to mail without needing to have an e-mail client installed and configured.
David Moseley only recently read the original HelpDesk item on e-mail account surgery in the May **PC Plus**, and followed the link I gave to the RFC on POP3. RFCs (Requests For Comments) document standards for Internet technologies and make for interesting if heavy reading. But among them are a few spoofs, two of which I mentioned. David e-mailed to tell me one I'd missed and which had tickled his fancy – visit www.cis.ohio-state.edu/htbin/rfc/rfc2324.html when you next require comic relief. Then move on to rfc1925.html and rfc2100.html if you didn't catch them first time round.

WINDOWS

Autoplay misbehaves

Q **Each time I boot up I get a Rundll error message as follows:**

```
Error in
C:\WINDOWS\SYSTEM\ShellExt\
target.dll
Missing Entry;
CDPlayNotify.
```

The error does not seem to affect any program that I run and everything seems to work as normal, but it's just bloody annoying! Any clues you might provide would be appreciated.
Roger Biddle

A This happens when you install Microsoft's PowerToys on Windows 98. PowerToys was written for Windows 95 and while it generally works on 98, there are few hiccups.

Find Aplayext.inf among the PowerToys installation files, right click it and then click Install. This will correct the problem. While you're at it, check the shortcut to FlexiCD that PowerToys puts in the StartUp folder. It may incorrectly point to Quickres.exe. If so, change its command line to point to C:\windows\flexicd.exe.

If you install PowerToys on 98, install the later version of TweakUI which was modified for Win98.

NETWORKING

Synchronising PC clocks

Q **I have a peer-to-peer network of five machines (Pentium III/650's) each running Win98 SE. Is there anyway to synchronise the system clocks, so that on boot-up they set themselves to the same time as a specified master?**
Frank Stewart

A Make a text file in Notepad containing this line:

```
net time \\server_name /set
 /yes
```

Change 'server_name' to the network name of the time keeper, for example \\Biggles. Save this file as "Synctime.bat" (use double quotes in the dialog box to prevent Notepad appending '.txt'). Copy it to all the client machines. Access each copy's properties and tick 'Close on exit' on the Program tab. A PIF (program information file) shortcut will be created to store the setting. Put a copy of it in the StartUp folder.

Make sure the time keeper PC is running before the others. Alternatively, you could set the batch file to run once per day or week as a scheduled task

WINDOWS

How to uninstall DirectX

Q **I know I am not the only person with this problem so I was wondering if you could tell me how to remove DirectX 7? Although Microsoft claims that DirectX is backwards compatible, I think otherwise because about half of my DirectX 6 games have stopped working since I installed DirectX 7.**
Ray

A Microsoft really doesn't want you to do this! DirectX 7 takes root so deeply that the official de-installation path is to format the disk and reinstall Windows.

Several Web sites also claim to have solutions which are less destructive, a couple of which I sampled on a Windows 98 SE installation.

Before trying any of these, make sure that your video driver is the latest version, it is possible that this may be your problem. Also, note that these methods may break Windows and, at worst, you could end up having to reformat anyway.

DirectX Uninstaller at www.ebrink.com/dxun/Direct.htm appeared to get rid of DX7 – or at least it didn't work any more – but the DirectX 6.1 installer was not happy and I couldn't subsequently run DirectX programs without seeing the Blue Screen Of Death.

From www.planetdiablo.de/wummy/dxb/index_e.html, I download DirectX Buster, another attempt at an uninstaller.

Running this on the now broken Windows appeared to do more than DirectX Uninstaller, so I then installed DirectX 6.1 again. BSODs were still in evidence.

As a last resort, I ran the Windows set-up program and installed Windows over the top of itself. This retained program settings and so on, and also cured the crashes. The DirectX diagnostic program reported a healthy DirectX 6.1 installation.

That's the way to go, then – but entirely at your own risk. DirectX is a complex beast and downgrading is a risky business.

➔ Further help resources

How to get information direct from manufacturers and help from fellow users

PCPlus SUPER DISC \prog\files\helpdesk\sites\hsnet.htm

If you need an updated driver or other help direct from a manufacturer, see if it has a Web site. One of the search engines will help you locate it – for example www.mamma.com, www.google.com, or www.northernlight.com.

I have compiled a list of Internet addresses of many leading hardware and software manufacturers. It is in the file hsnet.htm which you will find on the **SuperDisc** every month. Copy the Sites folder to your hard disk and bookmark hsnet.htm for instant access.

If what you want isn't there and the general search engines turn up tons of irrelevant links, try www.service911.com/content/SupportHelp.asp which has a searchable database of tech support contacts. If you find a site I haven't listed but which could be useful to other readers, please drop me a line at ian.sharpe@futurenet.co.uk.

Newsgroups are also a great source of help and advice. It is likely that your question has been asked and answered before, so before posting a message search previous postings at www.deja.com. And don't forget **PC Plus**' own newsgroups at www.pcplus.co.uk.

PCPlus MAILBOX

→ This month: PC related illnesses, Net appliances, computer cases and the **PC Plus** redesign....again

A real case

In your Helpdesk section in issue 167, you joked that not many people would be interested in buying a magazine which had 'PC case megatest!' on the cover. Personally, I would buy such a magazine. It seems that not many people realise how advantageous it is to choose the right computer case when building a PC. Most people would probably look for a case that had a lot of drive bays and one that looked nice but there are a lot more factors to consider.

For a start, a good case should have plenty of cooling options. There should be a generous amount of vents and a number of places to mount fans. The bigger the case then the more spaced out components will be (for example, the hard drive far away from the CPU) and so the cooler the system will run. Some people even claim that things such as the drives bays should be designed in such a way that any heat produced is properly distributed so that the drives are kept nice and cool.

A nice big case which is well laid out will make work inside it so much easier and all the edges should be well finished off so that there's no risk of cut fingers when working in the case. A well laid out case will make every component easy to access. The entire case should be very strong, you don't want components to be damaged because your case can't take any force applied to it, if your case is sitting on the floor then it could well be accidentally kicked.

It may not seem like there is a big difference between a cheap case and an expensive one but when you think about it, there is. Go on, be brave, be different, you never know, you might ell have a sell out even if the cover of your magazine does say 'Computer Case Megatest!'

Michael Christie

PCP Thanks for your thoughts, Michael. Cases are certainly an important part of a PC but only self-builders are generally savvy enough to specify exactly which one they want. What do the rest of you think? If there's enough interest in a Lab Test of PC cases, perhaps we could run one in a future issue. Let us know!

Stand up and be counted

I don't buy your magazine as a rule but the cover of issue 168 caught my eye, 50 Best Upgrades for under £150.

As I am thinking of upgrading I was glad that it was **PC Plus** that caught my attention. But that is not the reason I am writing; I was very happy to see that you stood up for Joe Public and put your money where your mouth is over the DCS Dionysus issue. Well done, and I would give yourself letter of the month – you deserve it – and they will have not done themselves a favour

I for one will not be using them. The PC public have to upgrade every one or two years, at least, to keep up with changes.

We do it because we like to use the new software coming out but that does not mean we are a soft touch. Once again, well done.

A. Loveland

PRIZE WINNING STAR LETTER

X marks the spot

In recent months I have been following the developments of Microsoft's games console the X-Box. Microsoft are planning for it to be used purely as a gaming platform and not for internet access, unlike some other consoles which use their ability to connect to the internet as one of their main selling points. I happen to agree with Microsoft (for once!). I have browsed the Internet with my friend's Dreamcast and I don't see why anyone with a PC would choose to browse the Net with a console which is incapable of downloading anything, has half the screen resolution and can't even use Java.

It is, however, another of Microsoft's proposals for the X-Box that interested me. The X-Box is planned to use a specially adapted version of the Windows kernel. If Microsoft lose their courtcase against the DoJ and are split into two companies – one for operating systems and one for everything else, then the X-Box company will no longer own the rights to any of the Windows operating systems, including the kernel. Since the X-Box company will not be allowed to write operating systems, will they have to pay another company to write another operating system and if so, will they be able to pay the Microsoft operating systems company to write a console-based version of the Windows kernel? Microsoft would then have to make a choice – admit that the Linux kernel is better than the Windows kernel and use a simplified version of the Linux kernel (which would make X-Box games run more efficiently) or, in true Microsoft style, be arrogant and carry on using the Windows kernel, so as not to admit defeat by the Linux movement.

If the X-Box did use the Windows kernel, would it also use DirectX? This would make it much easier for PC developers to port the DirectX games straight onto the X-Box. Microsoft would then have the option of charging royalties for programs using DirectX.

As the PC gaming industry has become very dependant on DirectX APIs, could this spell disaster? If Microsoft is split up, which company would continue writing DirectX? It is not technically part of the Windows operating system, however, it is written in order to attract games developers to the Windows operating system, so why would it be of interest to the non-operating system part of Microsoft to continue writing the libraries?

Daniel Newman

Write to PCPlus

Let us know what you think of the magazine

What do you like (or dislike) about the magazine? What would you like to see? And what do you think about the products and companies in the PC industry? Whatever the answer, we want to know.

➜ Please write in. Short, concise letters or e-mails are much more likely to be used, as life's too short to extract the important bits from a massive submission. We give a Star Letter prize away in every issues, so get those letters coming in.

➜ E-mail is the best way to send your comments. For Mailbox send them to: pcplus.editor@futurenet.co.uk or fax them to: 01225 732295.

➜ Alternatively, print your letter and send to: Mailbox, PC Plus, Future Publishing, 30 Monmouth Street, Bath BA1 2BW.

➜ Every letter will be read by the editor, and the most interesting (not the most complimentary!) letters will be printed and answered on these pages. We reserve the right to edit letters to fit, and the opinions expressed on these pages are those of PC Plus readers, and do not necessarily represent those of the editorial team. Letters and e-mails are assumed to be for publication unless stated otherwise, and published versions of letters become copyright Future Publishing.

➜ We regret that we can't always answer letters personally, but questions of general interest may also be covered in HelpDesk.

RSI risk

Having seen the 'Touchy typists' letter in **PC Plus** (Autumn 2000), I decided to write in to talk about my experience with the QWERTY keyboard. Up until a few months ago I was a very heavy computer user. At that point, I started having pains in my wrists. Fortunately, I knew what this might mean, and I went to the doctor and was diagnosed with keyboard related RSI (Also caused by heavy game use). Having found it early, I am now nearly recovered.

My worry is that children are being encouraged to use computers at earlier and earlier ages. We may find people that are even younger than myself (I am 17) with this frightening, career threatening problem.

Improvement in the layout of the keyboard can help stem the tide. Along with this, voice recognition is improving and is now a useful supplement to the keyboard, although only useful in simple situations. Most important of all, however, is education. Currently, education about RSI is limited to a few words in the beginning of a pupil's typing course about posture. This is rarely practically enforced. What is really needed is enforced correct use of a computer, along with information about the consequences of RSI, and most importantly, how to recognise the symptoms – many people ignore them until the pain is too much to bear. This dramatically increases a recovery time.

If all of these suggestions/keyboard replacements were put into practice, I believe we can at least severely delay the onset of RSI and possibly prevent it altogether. Surely this is more important than money spent on typing courses?
Alisdair Owens

PCP You couldn't be more right. Correct posture when using your computer is essential but the majority of people are poorly informed in this area.

Cookie lover

On page 108 of **PC Plus** 168 Jason Thomas states "Web sites can use cookies to surreptitiously remove personal information like credit card details". This statement is totally incorrect. Web sites can only retrieve information that they have stored in a cookie, they cannot retrieve information stored by anyone else. Therefore, they can only retrieve your credit card number if they were given it by some other means.

Cookies can be a great advantage to surfers. Their most common use is remembering Web site usernames and passwords. A bug in IE enables cookies from other Web sites to be read, but the site doing the reading must know exactly

how the cookie is stored, so this is not a significant security risk.
Ian Thomas

Nice neurals

Just a quick note that adds to Wilf's Workshop article on neural networks in September's issue: Wilf tells us that a tutor is needed to tell the network whether the changes to its weights have brought improvements or not and that genetic algorithms or other artificial life techniques provide the answers. Readers might be interested to know that neural network algorithms themselves provide the answer.

Generally they 'learn' either by association (strengthening weights between events that co-occur) or by calculating the weight change required to reduce any errors that the network is currently making.
Kevin Swingler, Neural Innovation Ltd

At home on the Net

Your article on home Net appliances and Martin Banks' insightful comments on the 'networked everything', led me to start thinking about how network technology could influence our lives, and I believe we have missed a crucial benefit.

Last week I went to the cinema and just as the film started I had a vision that I had forgotten to switch the iron off before I left the house. It started as a niggling feeling in the back of my head, but unfortunately developed into near panic as I envisioned my house burning and my valuable possessions going with it. At the end of the film (which I painfully sat through) I practically fled the building and drove straight to my house.

Fortunately my feelings were ill founded as when I arrived home my iron was switched off and my house was mercifully not burnt. Unfortunately, my worrying ruined my trip to the cinema. If my house were fitted with Net appliances I could have checked my Net enabled watch at the cinema and made sure the iron was off. If it was on I could have turned it off.

With Net enabled appliances would come peace of mind, and we could wipe away the mundane tasks of tweaking home appliances. How great would it be if before going on my next holiday I could simply say. "Computer, can you turn off all appliances and secure the house." But, of course, if I could turn off my iron, someone else could turn it on...
Leon Dean

Back to the fold

I get a variety of computer mags, and I remember yours in the past. You seem to have changed recently and I am a fan! This is unusual. As a crabby, suspicious complaining 50+ I have seldom praised anything in my life. But your latest issue was excellent – informative, complete (no assumption of previous knowledge – helpful sidebars). Not too many ads (pointless – we all get the same thing through the post and on-screen all the time). Liked the expo of DCS Co facts – real content! And Web records of previous issues available on-line – I'm hooked.

Well done! Yours is the first magazine (ever) that I have considered taking out a subscription for (apart from the 'Eagle' and 'Practical Wireless' as a boy).
John Griffiths

The perfect office

Congratulations! What a first rate contributor you have in Helen Bradley. Her **Masterclass** article on Office Outlining in Issue 168 was a model of clarity and a shining example of how a tutorial should be presented. Without the slightest condescension she succeeded in conveying in the most simple yet concise manner a complete understanding of this utility. The carefully selected screen shots were also perfectly matched to the text and displayed a complete understanding of how to present visual aids.

Up to now, I have used only the most basic elements of Office 97 Word and Excel, but literally within minutes of reading her article I was using Outlining

with confidence and to great effect. For me this one article alone has been worth the whole year's subscription to **PC Plus**.

Although Helen has 'waved a fond farewell to Office' is it conceivable that she could at some time produce a similar article on some of the more useful elements of that Cinderella program Access, one I also use extensively but at a very basic level.

PCP Helen will be back on to MS Office soon. If there are any particular subjects you'd like covered, why not drop us a line?

Biometric crackers

It is important to remember that even though biometrics may be the future of computer security, it is fallible, just as today's passwords are. For digital communications, everything has to be converted into a stream of digits, and with passwords, one copy has to be stored on the server to enable client interaction.

It will not be long after the popularity of biometric security takes off, that hackers who today work on cracking passwords, will be working on cracking these biometric codes which cannot be regularly changed.

It is not hard for somebody with the correct equipment to intercept a digital stream and reproduce that stream at a later date, effectively hacking (in the case of biometrics) peoples physical and behavioural characteristics, and as I already wrote, it doesn't have to be as complex as that:

Biometric security is simply a password that we don't have to remember, it is always on us. That password may be our fingerprint or voice pattern, but the first area of fallibility is that the biometric password cannot be changed, obviously this is an area which gives the present passwords a little more security as we are able to change our password every day if we feel it is necessary.

Second, the server is going to receive a stream of digits, and it won't know or care if that stream came from a biometric device, or a pre-recorded stream by somebody who happens to be listening in. Hackers will still be able to hack the passwords in the same way by getting the correct stream.

So to sum up, don't assume that as biometric devices can recognise a person they are not fallible, they are. Although it is virtually impossible to physically fool a biometric device, it is not impossible to bypass that device by going straight to the digits.

Owen Berg

The Bogo Cop Optic mouse has fingerprint recognition making life that little bit easier

New direction

The new look design is very good and is clearly intended to 'refresh' loyal readers as well as to encourage some unreliable readers to commit to subscriptions. Computing and Internet magazines have been trying killer covers, free software, competitions, exciting content, honest reviews, clean answering of questions, fastest news and other things.

PC Plus has not hidden the intention to become 'The PC magazine for the Internet' but somehow it does not sound right. Sections like Internet Buyer, Programmers' World and Web Watch are very good but they do not collectively strengthen the intention. There is nothing wrong with a big identification with the Internet but does it have to create an identity crisis for a PC magazine?

Within the new design one can't help but notice that **PC Plus** has taken a great step in the direction of living up to its 'our promise to our readers'. Good stuff.

Eric Molaodi

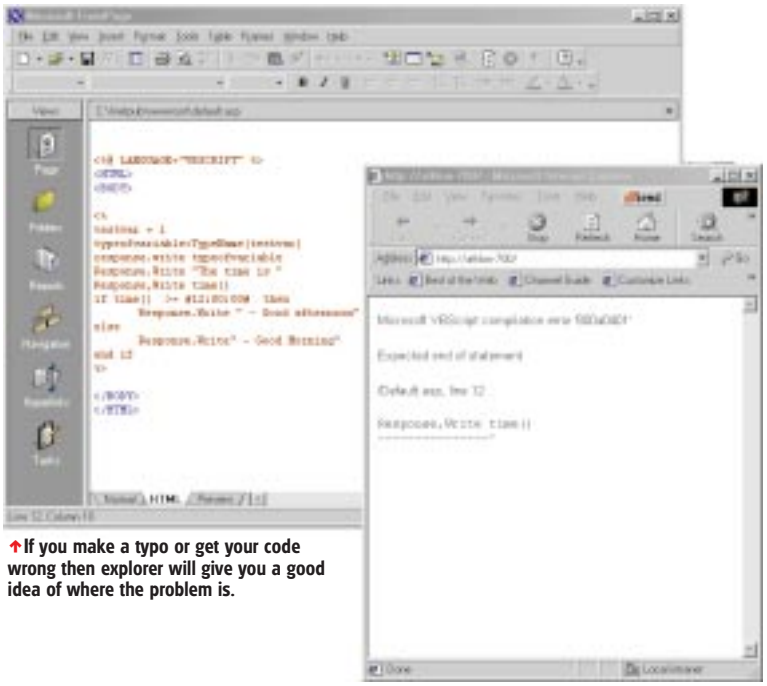
PCP In naming ourselves 'The PC magazine for the Internet', we are simply recognising the direction in which computing is heading.

Almost everything PC related is now also Internet related. It certainly doesn't mean we'll be cutting back on our coverage of hardware and software – it's simply recognising the all pervading nature of the Web in today's technology.

Active Server Pages: PART TWO

Getting interactive with ASP

Last month we looked at setting up a suitable platform for using ASP. Now we can try out some simple code



↑If you make a typo or get your code wrong then explorer will give you a good idea of where the problem is.

Most of you should have Personal Web Server on your system. If you haven't, go to add/remove programs in Control Panel (Start›Settings›Control Panel) and add it in the Internet Tools subsection of Windows setup. By default, Personal Web server installs your home page at **http://YourComputerName**. You can open this in your browser and see your own home page on the PWS. The default directory for this site is at **c:\Inetpub\wwwroot**, if need be, you can change this by using the advanced set up feature in the PWS Manager. If the server is installed correctly you should have an icon on the tool bar showing that the server is running. Double click on this and it will open up the PWS Manager, in the advanced options you can edit the properties of Home and use any directory that you wish. PCP

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PCPlus

NEXT MONTH

We'll make a start on form processing using the Request and Response objects which is the next logical step in getting information from the client machine

Editing the ASP

PWS makes the publishing and development of ASP simple for first time users

For the purpose of trying out any sample code, I'm going to use the defaults set up by PWS. Many of the features in PWS are aimed at simplifying the development and publishing of pages. These are great for the first time user but do mask the underlying simplicity of editing your own pages. If you open up wwwroot in explorer you should find a couple of files, global.asa and default.asp. The global.asa file is an optional file but is used to specify specific events and declarations (Objects) that can be used globally by your application. A typical example would be to declare an object to rotate an advert on a screen. This would have a declaration in the global.asa text file something like

```
<OBJECT RUNAT=Server SCOPE=Session
ID=MyAdvertRotator PROGID="MSWC.AdRotator">
</OBJECT>
```

Then from any page in the application, you could make a reference to this object from within your ASP script

```
MyAdvertRotator.GetAdvertisement("/ads/adrot.
txt) %>
```

However, the file that is of particular interest to me is the default.asp. This will be the one opened when I visit my home page on the PWS. You can try it out with your browser or even place a URL on your desktop for quick access. Right click on the background add New›Shortcut and type in the address of your home page that is **http://YourComputerName**. I've got FrontPage installed on my machine and it is used as the default editor for any file with an .asp suffix. This integrates well as I can edit the default page with this, viewing any HTML content and then see the effects of the ASP code by opening up the page in Internet explorer and refreshing it after each modification.

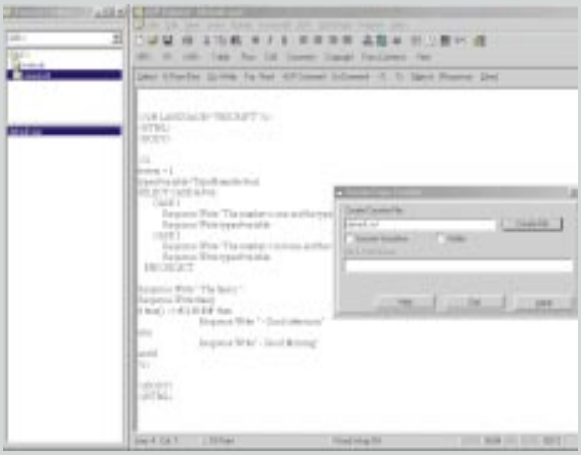
If it suits you, use Notepad or any editor to enter your source code. Notepad is fine and is less confusing when you're getting started. If you've installed Microsofts InterDev then this may be a suitable alternative. However, I've just come across ASP-Express, a dedicated ASP editor that will check out your syntax, insert all the information for an ADO connection automatically – you only have to insert the Connection/Recordset details and the assistants will do the rest, creating all of your SQL select or insert statements. There are a host of other features and perhaps we'll be able to do a separate review next month. It's likely to become the default editor and can be downloaded from **www.aspexpress.com/aspexpress.asp**. The latest version cost $90 but the previous release is free.

The key to gaining confidence in any new language is getting the syntax right. Pages of error codes can be quite off putting. ASP do have reasonable error checking. Make an error in your code and the next time you view the page in your browser it should give you line number and position of the error. Most modern Visual languages include language checking as standard and pull you up the minute you get it wrong. ASP Express enables you to insert many of the standard ASP control loops, create forms, drop into Java and insert comments at the click of a button. This does take some of the chores out of debugging and help maintain a common programming style.

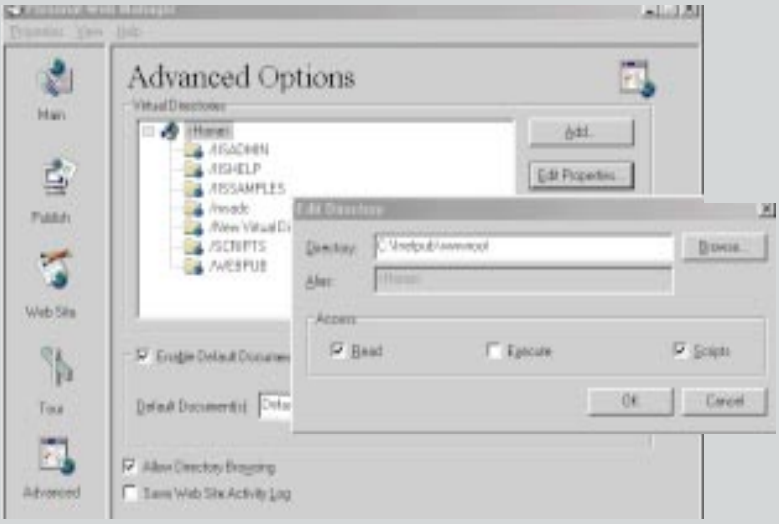
Getting started with controls and feed back

Last month I looked at the simple program to print Hello World in your browser. This could have been done very easily in standard HTML. I, however, declared a string variable in ASP to contain Hello World and used the ASP Response. Write command to tell the ASP response object to write to the browser the text contained in the variable.

```
<%@ LANGUAGE="VBSCRIPT" <%
TestVariable="Hello World"
```



We keep finding new ASP editors, this latest one called ASP Express has a host of useful features and is aimed more at the programmer than a simple page design and layout aid.



In the advanced setup of PWS you can choose the default directory to use for your Active Server Pages. We chose to use the default, where you'll find the default.asp page – we use this for all our test code.

```
%>
<HTML>
<BODY>
<%
Response.Write TestVariable
<%
</BODY>
</HTML>
```

This may seem a long winded way to do a simple task in HTML but it does serve to introduce the fundamental difference between ASP scripting and standard HTML code. Modify the contents of the variable and the ASP will generate HTML code on the server that replaces every incidence of that variable in the generated HTML that will be sent to the client. The declaration of the variable TestVariable is automatically Typed by the content assigned to it. In this case it is created as a string variable because the content is a string. VBScript supports many types and subtypes of variable and in most cases will automatically determine the data type. You could for instance assign any type of number to a variable. If it was whole then it becomes an Integer variable, similarly include decimal places and it becomes either a single or double depending on size. With this automatic declaration of variables, it is sometimes useful to find out what type of variable you're actually using. This is quite simple to discover with a couple of lines of code. VBScript has a function TypeName(), so if you've previously assigned a variable you can use it to check it's type – try this bit of code out on an ASP and view it in your browser

```
<%
testvar = 1
typeofvariable=TypeName(testvar)
response.write typeofvariable
%>
```

Including VBScript Command

In a similar way, standard VBScript commands can be included in the ASP script to gather information, process it and return the information in HTML. At the simplest level you can return the value of standard functions like date(), time() or now() this works in both VBScript and JavaScript.

Take a closer look at the following code:-

```
<%@ LANGUAGE="VBSCRIPT" %>
<HTML>
<BODY>
<%
Response.Write "The time is "
Response.Write time()
if time() >= #12:00:00# then
Response.Write "Good Afternoon"
else
Response.Write "Good Morning"
end if
%>
</BODY>
</HTML>
```

The first line tells the server that I'm using VBScript to code my ASP page. Then I start the HTML code in the normal way and insert the VBScript after the first ASP delimiter ‹%. Rather than print text using the standard HTML method I use Response,Write to insert the text The Time Is and then write the time with Response. Write time(). Next I use a control structure to test the value of the time. In this case it's the standard if-then-else structure. It looks at the value of time() to see if it's greater or equal to 12. The time is enclosed within #....# , as this is a subtype of the Date function. The '#' symbols that enclose the data, identify it as a date value and enable the value to be checked in the time format, rather than a string or numeric value. If the test is true (›= to 12) then the ASP will return Good Afternoon else I'll get Good Morning. You could equally use something like the case statement to check a far wider range of times and respond with other value like Good Evening or Time for Lunch. It could be an interesting exercise to test for the local time zone of the person accessing your page and compensate for their local time.

Code Corner

Using CASE

The CASE command can be used to check a wider range of conditions

The structure of the CASE would be similar to:-

```
<%
testvar = 1
typeofvariable=TypeName(testvar)
SELECT CASE testvar
CASE 1
Response.Write "The number is one and the type
of variable is - "
Response.Write typeofvariable
CASE 2
Response.Write "The number is not one and the
 type of variable is - "
Response.Write typeofvariable
END SELECT
%>
```

Try changing the value of testvar to 2 and then the next condition will be met. You can have as many Cases as you want to test for different values

→ Lotus Freelance Graphics, Millennium Edition has an option to save Web pages in JPEG format which gives good results for the online photo album.

Freelance Graphics: PART TWO

Making interactive photo albums

Lotus Freelance has a quick and easy-to-create photo album which can be saved on the Web for all to see. **Helen Bradley** shows you how

Want to share your summer holiday snaps with friends and family? You might think that Freelance is purely presentation software but, when you think of it, that's all your photo album is – a presentation of photos. The tools which go to make a useful presentation are handy for your photo album. For example, your viewers have the ability to move from one slide to the next to view your photos and you can easily add text and coloured backgrounds.

You can save your presentation to disk along with the viewer software which enables it to be played by anyone even if they don't have a copy of Freelance.

If you're using Freelance Millennium, you can save your photo album in a Web format for uploading to your Web site. While it looks like this option is available in Freelance 97, the resulting images are poor quality because you only have the option of saving your Web pages in .gif format. Millennium edition offers the alternative of saving the slides as jpeg files which gives you much better results.

Have an idea as to how you want to arrange the photos – it's usual to display them either chronologically or group them according to subject matter. Given the small size of the resulting screen presentation, you'll probably find that one image per page works best.

Creating the presentation

The instructions which follow relate to Freelance Millennium but will be easy to follow even if you're using an earlier version.

Open Freelance and from the dialog choose Create a New Presentation Using a SmartMaster tab, and from the Select a content topic box choose [No content topic] and from the Select a look area choose a design for your album and click OK. You'll find one that is wider than it is tall (landscape) works best for screen presentation.

When prompted to choose a layout, select Title to add a title page to your presentation. Click where each text prompt appears on the screen and type the title for your Photo Album and a subtitle. To omit the subtitle, simply click the text prompt, press the spacebar and press Enter.

Click the Clip Art prompt and add some suitable clip-art to the title page. You can alter the size of the clip-art and move it into a different position. To layer it behind the text, right click and choose Priority, Send to back.

To add your first photo album page, choose New Page and select Basic Layout and OK. This gives you a blank page to work with. To add images, open them in your graphics software and choose Edit, Copy. Switch to Freelance and choose Edit, Paste to paste them on to the page. You can then resize and arrange them into position.

Add captions to your images by clicking the Drawing & Text button and click the ABC button. Click and drag a text area on the page and type your caption in it. You can make callout style captions by choosing Drawing & Text and, in the Shapes with text area click the button on the far left in the second row. This gives you a range of callouts you can use to include fun captions on your images. Choose a callout and click and drag it onto your image. To change its colour, right click and choose Text Shape properties. You can change the fill, line and text colours to suit. To type text, simply click the shape and start typing. If you wish, you can rotate the shape and the text in it by right clicking it and choose Rotate. Use

your mouse to rotate it into position.

If you're planning to save your presentation to the Web, make sure you use small amounts of text at larger text sizes than you would plan to do with a standard screen presentation. The pages are sized down considerably when saved for the Web and if the text is too small it will be hard to read.

Animated slides

If you're planning to run the show from a disk rather than the Web, you can animate slides by setting different elements on the slide to appear at different times. Start on the title page and select an object to animate, right click and choose Group Properties for an image, or Text Properties for text. Click the Screen Show tab (the tab displays a movie projector) and choose Display page first, then display text/object. Click After and set the time to 1 second. Click Sequence and check the display sequence in the dialog. If you have images behind text, sequence them so the images are drawn first and then the text and click OK. Still in the Screen Show tab, you can set the Transition mode for the current object. Click on another object (text or clip-art) and you can set its transition mode while the dialog is still displayed.

To test the results, choose Presentation, Run Screen Show, From Current Page.

Adding sound

If you have a sound clip recorded in a .wav format you can attach it to an image in your photo album so the sound will play either when the image is clicked or after a set time has elapsed. To do this, first record your sound and save it as a .wav file. Now right-click the image which you want to attach it and choose Group Properties. Choose Display Page First, then Display Object and set the time to zero. To set a sound to play only when the image is clicked, choose Play sound from the Action When Object Is Clicked list box. To make the sound play when the slide displays, opposite the Sound area of the dialog, click Browse. From the Play Sound dialog box which appears, locate and select your sound file and click Open.

Saving to disk

You have a few choices when saving a presentation to be played on another computer. You can save the file as a standard .prz file and give it to another person who has Freelance and they can play it. If they don't have Freelance you can give them the Mobile Screen Player file and they can install that and play your presentation. In this case, when you save your file, choose File, Save As and enable the Prepare for Mobile Screen Show Player option.

Mobile Screen Show Player isn't installed with a Typical SmartSuite install so, to install it, you'll have to reinstall the program and choose Custom Install (rather than Typical) to install it. Alternately you can download the file from the Lotus Web site at **www.lotus.com**.

The other option is to use the Save and Go Wizard which packs both your presentation and the Mobile Screen Show Player up on a disk for you. Choose File, Save and Go and select the presentation to save and the drive to use. Enable the Include Mobile Screen Show Player checkbox to ensure the player is packed and click Finish to save the presentation.

The person receiving this disk only needs to run the file SNGSetup.exe from the disk to unpack the presentation and install the player on their computer. They can then play the presentation. PCP

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PCPlus

NEXT MONTH

We move on to a new application in Smartsuite

Quick and easy image tricks

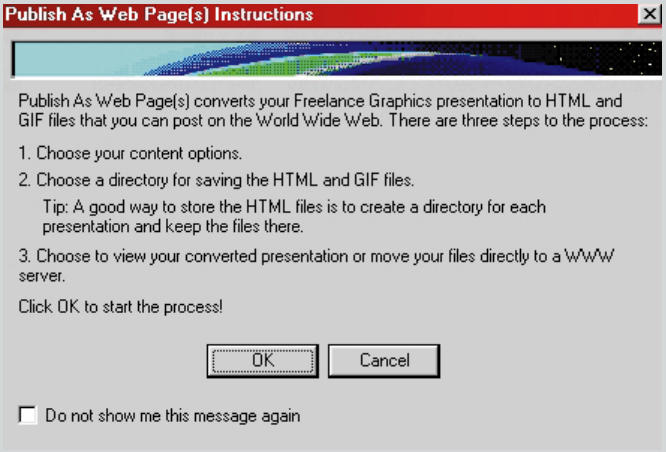
When you have two or more images on the screen or text which you want to line up neatly with the edge of an image, select the objects to line up by holding [Shift] as you click each of them in turn. Choose Collection, Align and, from the Align Objects dialog choose the alignment option to use for those images.

When you have two or more photos on a page and you want them to be the same size, Freelance does the work for you. Select the objects by holding [Shift] as you click them, then choose Bitmap, Object Size, Equal and they'll be resized automatically.

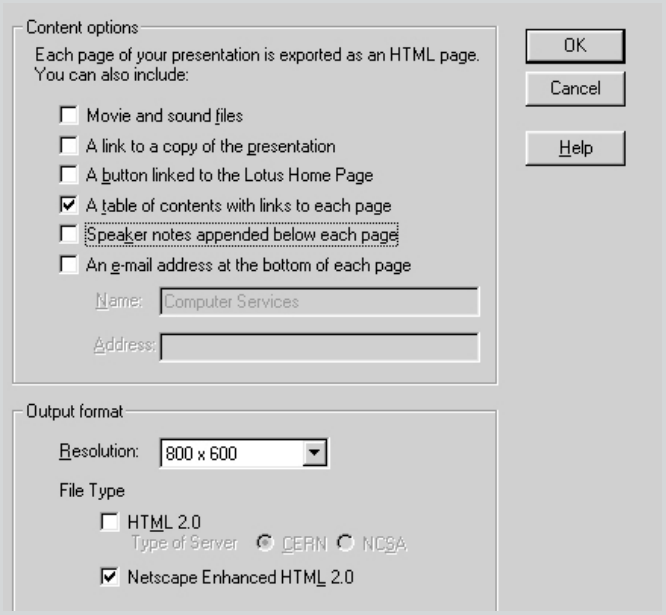
When you have multiple images on a slide, you can adjust the spacing between them to be exactly the same. If you first select all the images, then choose Bitmap, Space and, from the Space dialog, choose either the Space vertically or Space horizontally checkbox.

Saving to the Web

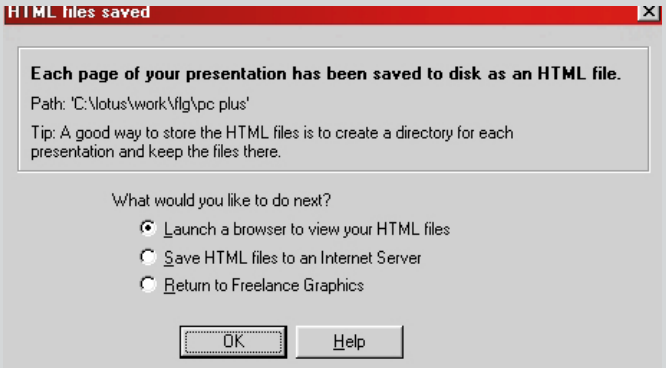
It's easy! Just follow the three steps below and everyone will be able to see your album



1 **When your photo album is complete, save it for the Web by first saving the presentation in the usual way by choosing File and Save. Now choose File, Internet, Convert to Web Pages and, if the Overview appears, click OK. In the Wizard, step 1, choose Single Image and alter the filename (which is currently set to index) to something different like album and click Next.**



2 **Enable the Table of Contents checkbox and, unless you have a reason to do otherwise, disable the other checkboxes for now. From the Format drop-down list choose JPEG (best for graphics, gradfills) and from the Resolution drop-down list choose 800 x 600 and click Next. Wait while Lotus saves the slides each as a separate Web image (it does this in the \windows\temp directory in case you want to check them out).**



3 **When the Step 3 dialog appears, choose Preview in browser to check your work. Lotus opens a browser and displays the first page of your photo album. You can click the title links down the left of the page to move from one slide to another or use the navigation buttons in the topmost frame.**

Graphics Masterclass: PART THREE

Touching up photos

Shift colour the smart way with Paint Shop Pro as **Alistair Dabbs** investigates a fast way of retouching problem photos

Fixing colour glitches in a photo you've scanned into your PC can often be hit-and-miss. For example, imagine you have a picture of someone in a lurid green jumper which you'd like to turn purple. You could try applying filters to the entire image or dexterously mark up an area with a lasso. You could always try painting colours onto the image with a brush tool, where the slightest twitch or overlap can ruin the result.

But if you're trying to change the colour of something specific in the image to another colour, there's a quicker way of doing it. Many photo-editing packages provide filter and brush effects which swap one colour for another. In Paint Shop Pro 6, it's called the Color Replacer, which you'll find in the main Tool Palette just below the Clone Brush.

It's really quite straightforward once you understand Paint Shop Pro's system of foreground and background colours, as defined and shown in the Color Palette. When the Color Replacer is selected, left-clicking and dragging on an image replaces instances of the currently selected background colour with the foreground colour; right-clicking switches this around by replacing the foreground colour with the background colour.

So if your currently selected foreground colour in the Color Palette is orange and the background colour is blue, the Color Replacer tool will paint orange over any blue areas it comes across as you drag the brush. Any other colour area will be untouched. Double-clicking with the Color Replacer will switch all instances of the colour throughout the whole image, including 'non-contiguous' areas. This way, there's no need to mark up selected areas for editing, and even the clumsiest of people can slap away with the brush.

This has many useful applications, beyond altering your photos purely for reasons of style! There are many times when you will want to alter the colour balance and properties of an image – regardless of whether you work in graphic design or not.

Take, for example, your photo collection of the office party – has your over-zealous use of the camera flash left your colleagues virtually with '666' stamped on their heads? Try the red-eye project here to get a handle on the way the Color Replacer tool can save the day.

Finally, if you have anything else you would like me to cover – please drop me an e-mail! PCP

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PCPlus

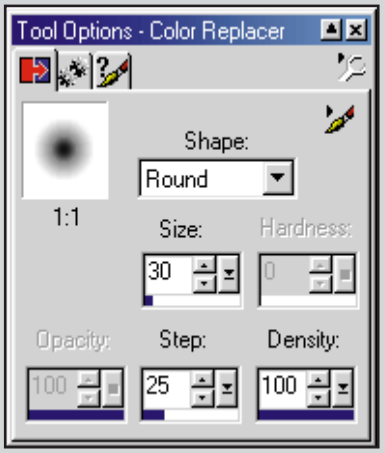
NEXT MONTH

Practical uses for the Perspective Grid in Macromedia Freehand 9

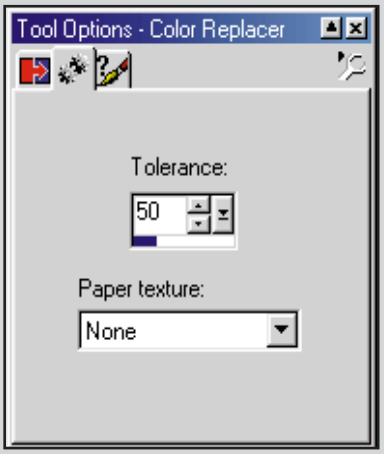
Controlling Paint Shop Pro's tools

Brush tools such as the Color Replacer need some fine-tuning. Here's how to do it

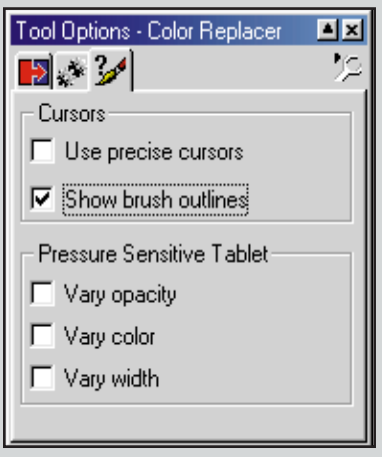
Open up the Tool Options palette by clicking on its button in the main Tool Bar at the top. After this, toggle it off and on by tapping the Tab key on your keyboard. The palette is context-sensitive according to which tool is currently selected. Switch tool at any time by choosing from a pop-up list at the top right of the palette. Numeric fields can be adjusted in four ways: typing new numbers into the boxes, using the little up/down scroll arrows next to them, clicking and dragging the pop-up slider to the right, or dragging directly on the blue bar underneath. Here are the options given when you are working with the Color Replacer.



1 In the first tab of the palette, you can set the shape and size of the Color Replacer brush. The Step value controls the consistency of your brush strokes: a low value will be more blobby, a high value will be more fluid. The Density value controls the brush 'bristles': a low value produces a grainy stroke, a high value gives a solid stroke.



2 In the second tab of the palette, you can adjust the tolerance of the colour replacement. This works as if selecting coloured areas with a magic wand tool: a low value replaces strictly the selected colour, a high value replaces the selected and similar colours. The Paper Texture pop-up lets you apply a texture to the replacement, but generally this should be set to 'None'.



3 In the third tab of the palette, putting a tick next to 'Use precise cursors' changes the tool cursor to a crosshair. 'Show brush outlines' shows the area size of the brush before you use it, and I recommend you switch this on. The other options only apply if you're using a pressure-sensitive graphics tablet with an expert touch in your fingers.

Put an end to red-eye

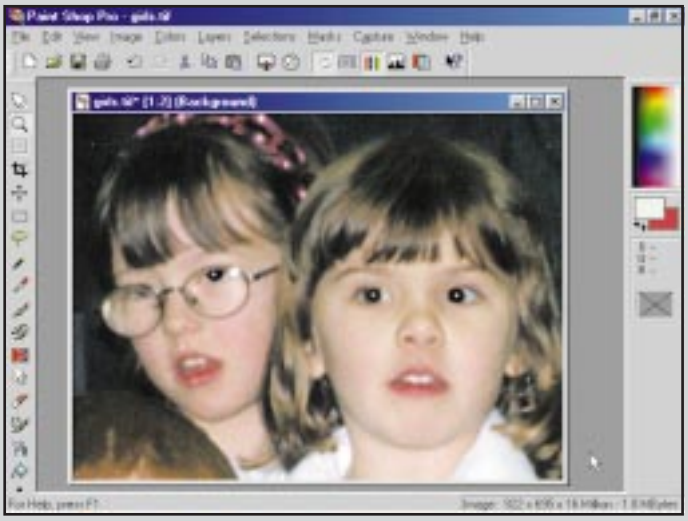
Exorcise those pesky retina devils with selective colour replacement

1 Every amateur photographer knows how to avoid pointing a flashgun directly at their subjects, but you don't have this luxury with compact cameras with built-in flashes. Here's a typical example of a cheap compact camera shot where the red-eye reduction hasn't stopped the flash from reflecting back off the retinas of the two girls. Our two little angels have been turned into devils by the most common problem in indoor photography.

2 Zoom right into one of the eyes like this. I'll warn you now that the technique you're about to learn works best with reasonably high-resolution scans; you can always reduce the image size after retouching. With the Dropper tool, right-click on the main red area in the eye to select it as your background colour. Left-click a black area of the image or a black part of the Color Palette mixer to select it as your foreground colour.

3 Now choose the Color Replacer tool. Click anywhere and drag back and forth over the eye. Only the red areas will be replaced with black. However, be warned that similar red pixels outside the eye area may also be turned black. You should adjust the tolerance of the Color Replacer in the second tab of the Tool Options palette. Remember you can press [Ctrl-Z] to undo, reduce the Tolerance value in the palette, and try again.

4 You're probably now looking at a harsh black area surrounded by a red-tinged ring. Choose the Retouch tool and, in the Tool Options palette, make sure Retouch Mode is set to Smudge. Use the tool to massage the edges of the black area so they blur over the red ring and smooth off the harsh edge. Drag from the inside of the black area outwards. If you go too far, drag back from the outside inwards.



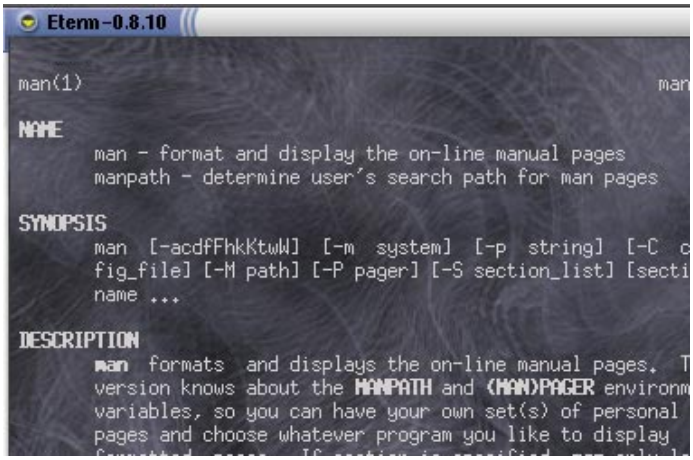
5 To finish off, I have chosen the normal Paint Brush tool and selected a pure white as the foreground colour. I then clicked once in the black areas of each eye that was retouched in order to give the illusion of a glossy reflected highlight, even if there wasn't one to start off with. This enhances the illusion of un-redding the eyes, but make sure the white dot remains small and (in most cases) off-centre otherwise they'll look weird.

6 And, Voilà! From devils to angels, our two little girls are restored to normality, thanks to the colour replacer tool, and some creative art work. Fixing your ruined family photographs really isn't as hard as it may first seem, so long as you are creative and have a clear idea of the end result you want to achieve.

Getting started with Linux

Using Command Line Tools

Maurice Kelly moves on to using command line tools and heads off in to a new text-based sunset



↑In a strange kind of way, you can find out more information about using man pages by entering man man.

PCPlus SUPER DISC **PATH: \prog\linux**

Over the last five months I've looked at a number of aspects of getting started with Linux, but in general I have had a tendency to do a lot of work using graphical tools. I thought it was about time we really got to know Linux without clicking on icons and all that other GUI nonsense. Yes, this time round I'm going to have a quick look at the command line, and a closer look at some handy command line tools.

First, though, we have to take a look at the command line itself. There are two ways in which you will generally use the command line (or prompt as we sometimes call it). The first usually involves opening a terminal window from your X session – something like konsole, GNOME Terminal, and so on. For Windows users, you may think that this is similar to opening an MS-DOS Prompt from your start menu – in a way it is, only the Linux command line is a lot more powerful!

The other way to use the command line is to use a console instead of X. If your Linux box boots straight into X then there's a chance that you've never used the console, but if you want to use it you can – simply press [Ctrl]-[Alt]-[F1] while in X and you'll be brought back to the command line. Don't worry, your X session is still there and you can press [Alt]-[F7] to get back to it. If your box doesn't boot straight into X then it's likely that you have already experienced the console. To utilise the console at this point you should log in with your normal Linux username and password.

Command line functionality is provided by a program called a shell – it is this program that accepts your input and acts upon it. There are a multitude of Linux shells but the most commonly used one is Bash. Most of the shells act in a similar manner, but they can be different at times – this master class should be independent but I must admit that it has been impossible to check all possibilities!

One highly useful feature of the shell is the ability to 'pipe' the output from one command to another. It is common for a command to generate a large amount of output that cannot all be seen on screen at the same time. In these situations it is best to use a pager – a program that enables you to view the output a page at a time. I do this by piping the output from my command into the pager:

```
$ cat /usr/dict/words | less
```

This lets me browse the entries in the system dictionary. Note that multiple pipes can be used. If I wanted to see the contents of the dictionary in reverse order I can issue:

```
$ cat /usr/dict/words | sort -r | less
```

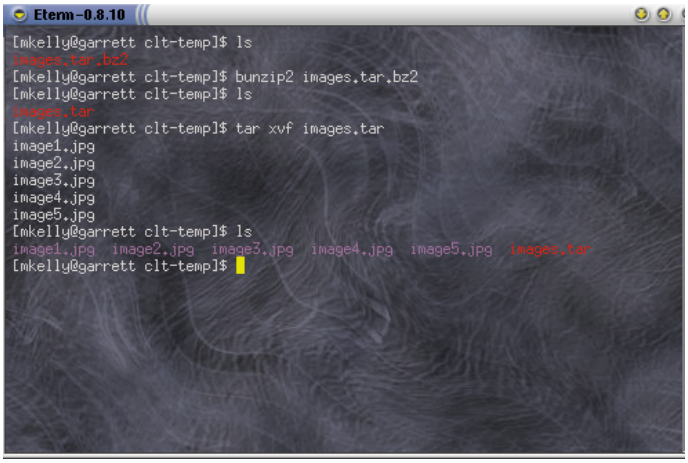
The sort -r sorts the output of the cat command in reverse order.

How does it work?

If you're having trouble with commands there are a couple of places you should go to for help.

→13 down – Five letter, facial adornment common among hackers, first letter b, third letter a and last letter d.

→A tarball might sound like something the cat coughed up, but it's actually a common way to distribute collections of files. Here we extract the contents of one such tarball.



First, it's worth trying to issue the command as cd —help. The —help option is fairly standard among the GNU tools that Linux distributions are based upon, and will usually display a list of the more common options.

For fuller help you should read the manual pages – the manual (or man) pages are installed for most software that you put on your Linux box, and are accessed by using the man command. Usually the name of the tool is what you supply as a parameter to the man command, for example man cd, although you can also look up information on configuration files and other documentation.

Lost something?

There are a number of ways to find items in your filesystem, but I'm going to start with the 'find' command. The basic structure of the find command is find path expression. If you specify a path (or multiple paths) the find command will recursively search down the filesystem starting from those paths. The expression tells the command what files to look for and what actions to take.

For example, if I wanted to find the file XF86Config but wasn't sure if it was under the /etc or /usr/X11R6 paths, I can tell the find command to look in those paths for that filename. To specify a filename pattern to search for we use the expression '-name pattern' so the command I use will be:

```
$ find /etc /usr/X11R6 -
ame "XF86Config"
```

Unfortunately on my system I actually have two XF86Config files – one in each of the two paths I searched. I know that one is a file and one is a soft link to the file, so I need to modify my expression to only return results which are real files. I do this using the -type f option added to my expression:

```
$ find /etc /usr/X11R6 -
ame "XF86Config" -type f
```

Now I know my XF86Config file is in /etc/X11. Find has many options that allow precise location of files and many more tricks besides. For example, I can remove all files in a directory that begin with a by issuing the command:

```
$ find . -name "a*" -exec
rm {} \;
```

Another useful tool for finding files is the locate. This searches a pre-built index of your filesystem for the expression given. Note that to use the locate command effectively you must regularly update the index using the updatedb command as root. Most distributions have a cron job which performs this task but a desktop system might not be switched on at the times the job is scheduled to run.

The index stores every path to every file on the system and can sometimes give a vast array of results for what you though would be a unique file. For example, if you have a file called usr somewhere in your home directory, and you issued:

```
$ locate usr
```

it will return a match for every file that exists in the /usr directory and it's sub-directories. It is possible to use regular expressions with the locate command by specifying the -r option. For example, locate -r /usr$ will return only files and directories called usr making it easier to find the file we were looking for. Regular expressions were covered by Matt Kynaston a number of issues ago.

Catch a grep

While on the subject of regular expressions, the next command you really need to know is grep. The grep command can be invaluable when searching for particular strings of text within a file (or multiple files) and the output of other commands.

If I want to locate the string 'PC Plus' within the files in the current directory, I can enter the command:

```
$ grep "PC Plus" *
```

I've told the command to look for the string within all the files in the current directory. If I have any files containing the specified text the output from the grep will display filename and the line the string appears in. Recent versions of GNU grep (which you are most likely using) have the -r option available which enables you to search recursively through all directories from the starting path.

I just matched on a simple string above but the real power of grep comes into play when you use complicated regular expressions, for example if you only wanted the occurrence of 'PC Plus' at the end of a line you would use:

```
$ grep "PC Plus$" *
```

As I said before, it's not just for dealing with files, because you can pipe the output from other commands into grep. If I wanted a list of all the dictionary words beginning with the letter a, but sorted into reverse order I could use:

```
$ cat /usr/dict/words |
sort -r | grep "^a"
```

Grepping the system dictionary might seem pointless at times, but it can be useful for doing crosswords! Grep has many more options, and it is advisable to read the man and info pages ('info grep') for more details.

Other goodies

The average Linux system has a plethora of command line tools, but space and time constraints mean that I can't even make a serious dent in them here. There are others that are worth knowing about though. The apropos command is very useful for searching man pages for a keyword and many GNU tools are documented more fully in the info pages (invoked by info commandname.) The split and cat commands are useful for breaking up large files into smaller chunks, and putting them back together again. df and du are useful in determining the free space and usage of your disk drives.

The best way to learn more about command line tools is to read about them, but it's hard to know what you actually have. I recommend the O'Reilly and Associates book Linux In A Nutshell which features detailed information on many of the GNU tools we all use on Linux systems. PCP

Maurice Kelly
mkelly@pcpmag.co.uk

How to use tarballs

Save download time when you distribute collections of files

If you've ever heard anyone talking about tarballs you may have wondered what on earth they are. A tarball is a collection of files compressed for easier distribution. They get their name from the tar program – tar was (and is still) used for creating tape archives but is most commonly used to archive a number of files into one large file. This is almost a tarball, but at this stage the file is still uncompressed – a program such as gzip or bzip2 is necessary to reduce the file size.

Say I had a collection of images that I wanted to send to a friend – it makes sense to compress them to save download times. I'll do this in two steps – first I collect all the images into one large tar file:

```
$ tar cvf images.tar
image1.jpg
image2.jpg image3.jpg
```

I've told it to compress (c) verbosely (v) into the file (f) images.tar the files image1.jpg, image2.jpg and image3.jpg. The second stage requires me to compress the tar file – in this instance I will use the gzip program:

```
$ gzip images.tar
```

This creates a new compressed file called images.tar.gz and remove the old tar file. You could use the bzip2 compression program instead of gzip, as it is gaining popularity because of its more efficient algorithms (you should use an extension of .bz2 to indicate that you have used it.)

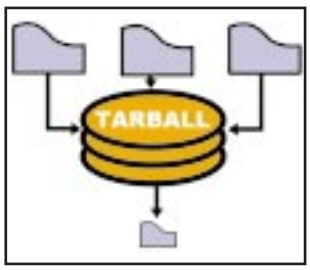
If those two steps are too much for you it is possible to directly invoke gzip for compression using the z option to the tar command – the following is equivalent to the two commands before:

```
$ tar czvf images.tar.gz
image1.jpg image2.jpg
image3.jpg
```

To get data out of a tarball you need to uncompress it using the appropriate decompression companion program (gunzip or bunzip2.) For images.tar.gz, the following commands empty its contents:

```
$ gunzip images.tar.gz/tar
  xvf-
```

The x option to the tar command stands for extract.



↑ The UNIX 'tar' command will take multiple large files, and produce a single smaller, compressed, file – a 'tarball'.

FORUM **www.pcplus.co.uk/forums/linux**

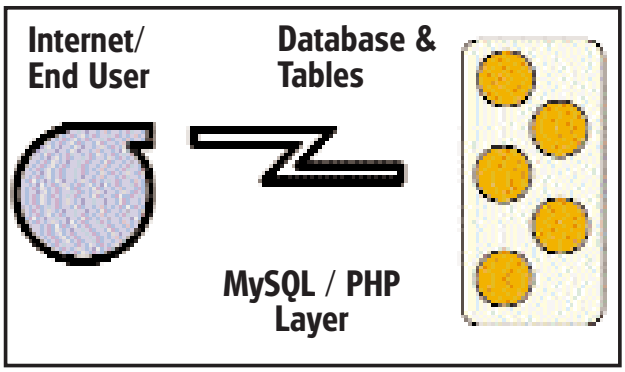
PCPlus NEXT MONTH
We return to the land of pretty GUI pictures in X

Expert Linux

Digging deeper

PCPlus SEE YOUR SUPER DISC

David Coulson heads in to the realm of advanced MySQL and PHP



→A MySQL calls layer sits between the end user and the data in your database table

Last time we started to create our database tables and do some simple MySQL queries using PHP. Now we are going to do a few more complex queries with MySQL as well as extend the use of PHP so we can do a lot more with the output MySQL gives us.

Date and time

At the moment our tables simply give each track a unique id dependent upon the order they were added to the table. We'll have MySQL store the date we acquired the track, rather than the date when it was added to the database, so if you find yourself hunting for a specific track and have a rough idea when you got it, it'll make digging it out a lot quicker. First, we need to add another column to our tracks table using the ALTER command:

```
ALTER TABLE tracks ADD aqdate
INT UNSIGNED NOT NULL;
```

aqdate is simply an abbreviation for acquired date. The first thing you'll probably wonder is why I'm using an INT to store the date. Well, we're not going to store the date in the ISO standard YYYY-MM-DD, instead we're

PCPlus SUPER DISC **PATH: \prog\linux**

going to go for the number of days since the 1st of January 1970, the epoch. MySQL may know how to convert 2000-06-06 into 730642, but PHP hasn't got a clue, at least not without doing some extra code using mktime() and explode(). If we want to start correcting out current table we would use UPDATE in the following way:

```
UPDATE tracks SET
aqdate=TO_DAYS('2000-06-06')
WHERE tkid=1;
```

and MySQL will use TO_DAYS() to convert 2000-06-06 into an integer.

Dave Coulson
dcoulson@pcpmag.co.uk

PCPlus

NEXT MONTH

How to put things right with error handling when MySQL doesn't want to do what we want it do

→MySQL dating

For PHP to understand MySQL's timecode, the current table needs to be corrected using UPDATE

In PHP we were previously running:

```
SELECT * FROM artists NATURAL JOIN albums NATURAL
 JOIN tracks;
```

but we need to do things to aqdate in MySQL, so we get a useful date in PHP. First, we need to do a SELECT on tracks, rather than artists:

```
SELECT * FROM tracks NATURAL JOIN albums NATURAL
JOIN artists;
```

Next we need to convert our date into a UNIX timestamp, which is the number of seconds since epoch. We would do this withl:

```
SELECT UNIX_TIMESTAMP(FROM_DAYS(730642));
```

This will produce a rather large number of 960246000, but 1970 was quite a while ago. PHP's date() function will quite happily generate meaningful textual dates from this, so we don't have to mess around with MySQL any more. Now, if we do:

```
SELECT UNIX_TIMESTAMP(FROM_DAYS(aqdate)) FROM
tracks NATURAL JOIN albums NATURAL JOIN artists;
```

It won't return all the other columns anymore, so we need to manually add them into the query:

```
SELECT UNIX_TIMESTAMP(FROM_DAYS(aqdate)) AS
aqdate,tkid,name,track,album,albums.alid,artists.
aid FROM tracks NATURAL JOIN albums NATURAL JOIN
artists;
```

Note that we used artist.alid, rather than just alid, because there are two columns with the name aid in the returned table. artists.aid tells MySQL that we want to use the one returned from the artists table, rather than from the albums table, although as the NATURAL JOIN requires both of those fields to be the same, it won't make any difference if you decide to pick a different table.

We also use AS aqdate, so the value of UNIX_TIMESTAMP(FROM_DAYS (aqdate)) ends up in a column called aqdate, rather than UNIX_TIMESTAMP(FROM_DAYS(aqdate)). It could quite happily be called foobar or something, but we'll use aqdate so we know what it is. As well as the date we bought (or otherwise) the track, it's also helpful to know how long it is. We achieve this using yet another column:

```
ALTER TABLE tracks ADD playtime MEDIUMINT
UNSIGNED NOT NULL;
```

We've just use a MEDIUMINT to save disc space, so if you have mp3s longer than about 18hours, you'll have to use INT. As with the date field, we can just use UPDATE to set the fields for our current entries:

```
UPDATE tracks SET playtime=TIME_TO_SEC("00:4:05")
where tkid=1;
```

TIME_TO_SEC() converts a 'HH:MM:SS' string into the number of seconds, so we can store it in an integer field.
When we come to extract the data we use:

```
SELECT SEC_TO_TIME(playtime) FROM tracks;
```

and we end up with what we started with.

We can use date() in PHP with the output from playtime, as it's the number of seconds after 12:00am GMT. If you try it, you'll notice that it says 01:04:05, not 00:04:05. Because we're in BST, rather than GMT, it will make an allowance for that. The easiest way around this is to configure all your servers to stay in GMT all the time, which solves a lot of problems. If that sounds a little extreme, you can always use gmdate() which will take 0 as being 12:00am, rather than 1:00am as date() does.

You'll probably be able to find a million and one things to do with this, such as sorting tracks by length, or just remembering when you got them. This method is not very efficient and there are many neater ways to store the data. For example, you could store the track length as the time portion of the date, then have aqdate as a INT storing the timestamp, or use DATETIME to store it as an ISO date 2000-06-06 00:04:05.

Playing with the data

We've looked at a number of SQL queries, but this is supposed to be about using PHP with MySQL. PHP has a wide variety of functions which you can use to handle MySQL connections, queries and such like.

Last time, to initiate a MySQL connection we did:

```
$dbh=mysql_connect("localhost","Web","WebApp");
mysql_select_db("web");
```

While there is nothing wrong with doing that, every time we run our script, it'll create a new connection to MySQL, do the queries, then close it. PHP uses the mysql_pconnect() function to create a persistent connection between the PHP code and MySQL. It has exactly the same arguments as mysql_connect, so you just need to pop a p before the connect. In theory, it's a good feature, but on a highly loaded web server it's not particularly useful. For each httpd we run, we must also have a mysqld thread, which appears as a process in Linux. Quite quickly, we can end up with a vast number of processes, each with their own file descriptors and before long, the machine will die. This is a limitation of Linux, rather than either MySQL or PHP, so if you think you'll be getting an awful lot of http requests, stick to using mysql_connect();

We're going to start off with a really stupid and simple queryL:

```
$result=mysql_query("SELECT * FROM tracks");
```

Rather than using mysql_fetch_row(), we're going to extract individual fields from the table MySQL returns. If you run mysql and perform the query, you get a nice little table with six columns. If we wanted to find out the value of the first name column we can do:

```
$name=mysql_result($result,0,'name');
```

0 being the first row and name being the column. name is also the 2nd column in the table, as they start at 0, so we can also do

```
$name=mysql_result($result,0,2);
```

A numerical table reference is particularly useful if you neglect to use AS foo when performing a expression on a variable.

We can also step through the results using a for loop, rather than a while() loop. Of course, we first need to know how many rows there are in the result;

```
$rows=mysql_num_rows($result);
```

This returns the literal number of rows, so if there are two rows, it returns two, but they are numbered 0 and 1.

```
for($n=0;$n<$rows;$n++) {
    $name=mysql_result($result,$n,2);
    print $name."<br>";
}
```

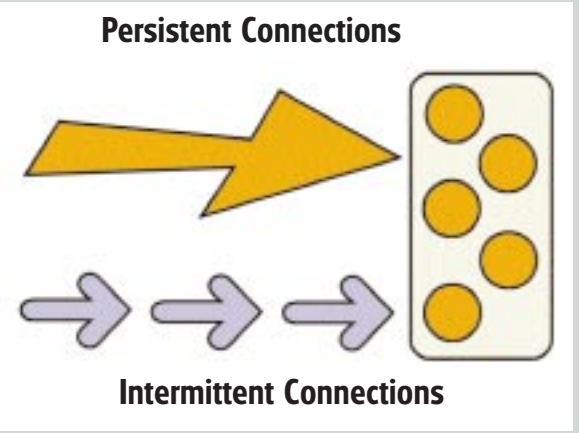
A useful thing to do, particularly when your trying to visualise the result, is to generate a HTML table containing the data, like MySQL produces.

We know how to obtain the number of rows, but the number of columns is slightly different. We need to know how many there are, but we also need to know what they are named. The number of columns is taken from $result using:

```
$cols=mysql_num_fields($result);
```

and the name of a specific field is found using

```
$field=mysql_field_name($result,2);
```



↑It would be nice to keep a persistant connection to our server and not drop it until we're finished

which would return name in our case. And we can then start to construct our table

```
print("<TABLE WIDTH=100% BORDER=2><TR>");
for($c=0;$c<$cols;$c++) {
    print("<TD
ALIGN=CENTER><B>".mysql_field_name($result,$c)."<
/B></TD>");
}
print("</TR></TABLE>");
```

Next we need to extract each row's set of fields from the result, using mysql_result as before, although we need two loops, one to span the row, the other to span the table. We can be reasonably confident that $cols will not change between the different rows, so in order to improve efficiency of our script, we'll only check it once.

```
for($n=0;$n<$rows;$n++) {
  print("</TR><TR>");
  for($c=0;$c<$cols;$c++) {
    print("<TD
ALIGN=CENTER>".mysql_result($result,$n,$c)."</TD>
");
  }
}
```

Make sure the final print("‹/TR›‹/TABLE›"); comes after the loops, or you'll end up with a table which doesn't render correctly in Netscape.

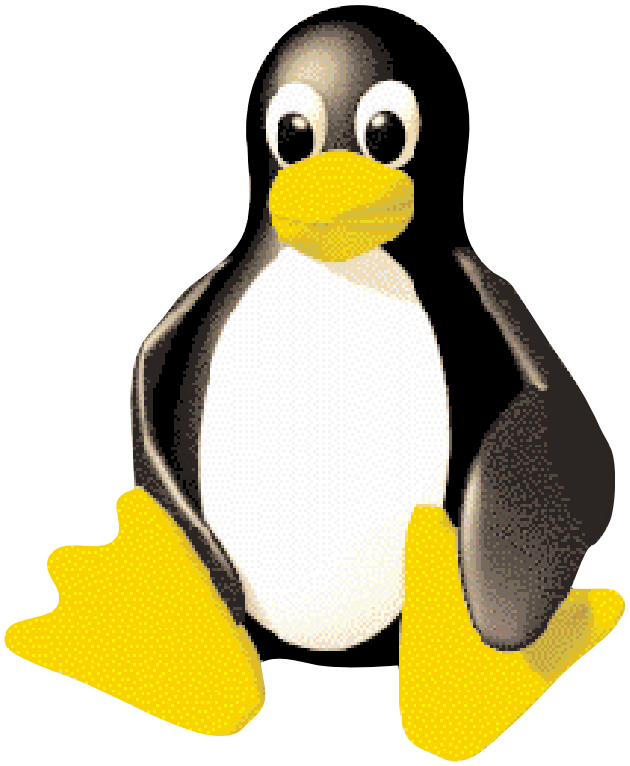
Another quite handy thing to do in PHP is to obtain the type of field. We use mysql_field_type to do this, so we can change our initial column loop to add this;

```
for($c=0;$c<$cols;$c++) {
    print("<TD ALIGN=CENTER><B>".
          mysql_field_name($result,$c).
          " (".
          mysql_field_type($result,$c).
          ")</B></TD>");
}
```

There are many other types of data you can request from MySQL which you can use to extend the detail of the table. If you're after PHP based database administration, you probably don't want to go and write it all yourself. Fortunately, some good folk have already taken the liberty of doing that for us and releasing it as open source. PHPMyAdmin is an excellent web administration tool for MySQL, providing all the features of the command line mysql client, but in a far more usable form. More information, as well as the tarball is available from http://phpwizard.net/projects/phpMyAdmin/. There are a number of security issues with PHPMyAdmin, so make sure you either use a htpasswd/htaccess setup on your Web server or thoroughly read the documentation before putting it on a publicly accessible server.

Your Linux questions answered

David Coulson tackles the latest bunch of questions with youthful enthusiasm and Vodka



RedHat 6.1

Q I recently installed a peer-to-peer network between my RedHat 6.1 system and another machine. (Inserted network card and reinstalled RedHat 6.1 for disk reasons) Before, I could connect to the Net fine. Now that I have a network as well, I can connect using kppp, or pppd and the connection is shown under ifconfig. However, I can't receive packetsback when I send packets to certain ports. I can ping my server and receive packets back, I can telnet my server and receive packets, but I can't telnet my mail server (Port 110) or browse the web (Port 80 or 8080?) I am not running a proxy server The packets get sent and appear on the graph of Details for kppp but only packets for the successful things I have mentioned appear for 'in' but under 1kb/s. I have a 56kflex modem that is working (Windows 95) and was working under Linux with very good speeds. The server settings are correctly configured as they always were.
M.Blonde, by e-mail

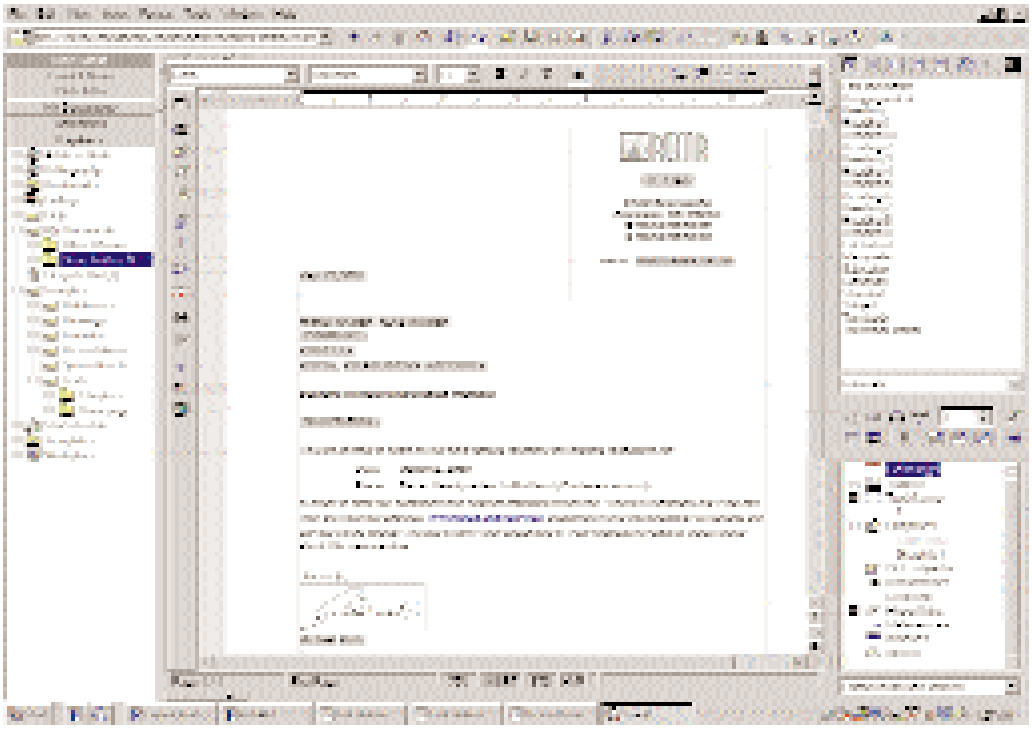
FORUM **www.pcplus.co.uk/forums/linux**

A It looks as if either IPMasquerading or IPForwarding are not enabled. You need to make sure the machine that is not connected to the Internet has its default route set as the internal IP of the machine which manages the dial-up connection. All other configuration needs to be performed on the machine with the modem attached, known in this instance as the gateway.

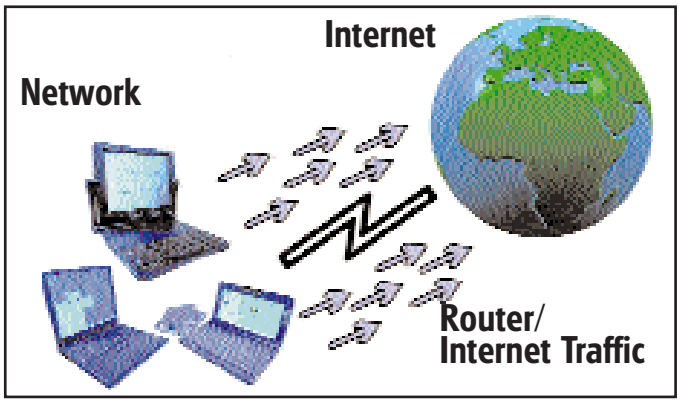
Check that you have IPMasquerading compiled into the kernel. If you don't, then you will have to rebuild the kernel with that option enabled (it's under Networking Options). You'll also have to grab yourself the latest release of ipchains from either freshmeat.net or from your distributions ftp server. Once that is done, you need to do

```
echo 1 > /proc/sys/net/ipv4/ip_forwad
ipchains -P forward -j DENY
ipchains -A forward -s 10.0.0.0/8 -d 0/0 0-j MASQ
```

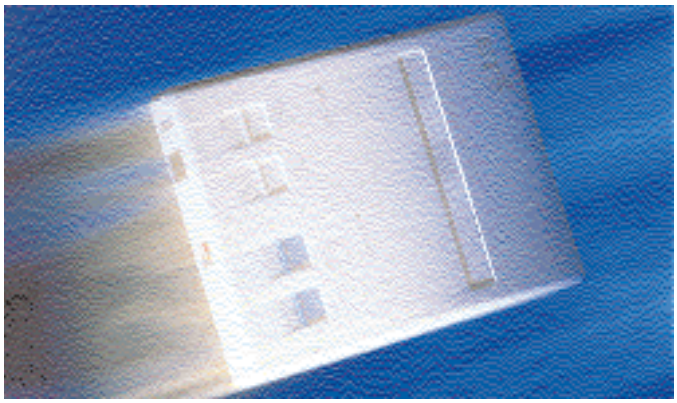
This assumes that you are using a 10.x.x.x address internally. Change it to 192.168.0.0/16 if you are using an IP in that range instead. You should find that everything will work okay, although if you want to use proper ftp, you'll need to compile and 'modprobe' the various additions kernel modules, such as ip_masq_ftp for the connection tracking capabilities. You don't need to set up any other software, unless you find yourself in need of a web cache, and. if this is the case, SQUID will be able to provide you with an excellent tool that is suitable for the job.



←IPMasquerading needs to be enabled in order to receive packetback with RedHat 6.1



↑Creating a software router is easy with Linux



↑Will it work? Won't it work? Plug in your modem and see!

Slow loading Linux

Q **I installed Mandrake Linux 7.0 off your May 2000 Superdisc. But, I find Linux is slow compared to Windows when running on the same PC. I have both booted on a Pentium 200 with 164mb of Ram. Windows and Linux share a 4.3GB Hdd.**

I know my PC isn't the most up to date in the world, but I was disappointed by the speed of Linux compared to Windows. For instance, I loaded Star Office 5.2 from the August Superdisc. It installed fine, but when I launch the application it takes over a minute and a half to fire up.

My question is this: are there any ways of tweaking Linux for the best performance? Or does it just look after itself?
Paul Harding, by e-mail

A Many people say that Linux is a lot slower than Windows 9x after installation, simply because they don't know what else is running.

If you boot up the machine, login as root and run ps ax you will probably find a ton of processes for things such as Apache, which you don't need to run. You can either remove their entry using a runlevel editor such as LinuxConf, or 'rpm -e apache'. If you don't know what a particular process is, don't remove it. It's wise to build a customised kernel for your individual machine architecture, in your case 586. Most distributions have various kernels and automatically install the right one. There may be other features which you don't need within the kernel.

Star Office is a fairly massive program, partially because it is a single binary, so it does take it a very long time to load. Check to make sure that Linux has plenty of spare swap space. It won't make Star Office run any slower, but it will give it room to swap out stuff you're not using.

Star Office is by no means a great example of a Linux application. If you run another program, such as the Gimp, you'll find it loads up far quicker and responds much more smoothly. Star Office was ported from Windows and took along a lot of bloat at the same time.

Colour displays

Q **I have the Corel Linux distribution. My video card is a Diamond Stealth 3D 2000. It has been successfully configured using the XF86Setup utility. However, it does not display colours properly. It does not matter what colour depth is set in control centre, all of the pictures are displayed with no more than 256 colours.**
Serge Koulee, by e-mail

A You will firstly want to check /etc/X11/XF86Config to see if it's actually set up to use something other than 8bpp. There should be a line similar to: DefaultColorDepth 16 within the Display section, usually near the bottom of the XF86Config file. If it lacks that, then it will automatically use 8bpp. You can just add that into XF86Config using whichever text editor you like, then restart X.
You can check what colour depth X is currently running by using the 'xdpyinfo' program.

```
xdpyinfo | grep depths
```

You will be returned one or more lines with the current colour depth. 8bpp is 256 colours, so if it returns

```
depths (1): 8
```

Then X is not configured properly. As the Diamond Stealth 3D uses the XF86_SVGA X server, it may be that your card is not capable of doing more than 8bpp under X, in which case you may have to use something such as Accelerated X (www.xi.org) or check up on a new version of X. If, at the end of the day, it still doesn't do what you want it to, the only option is to swap it out for a video chipset with better support.

Corel dual boot

Q **For some time I have been keen on getting to know Linux, and I have recently installed the Corel version on my laptop as a dual boot. I use an external hard-drive through a PCMCIA card, which works fine through Windows 98 (and previously Win95). I simply slide it in and the system can recognise it.**

However, in Linux, I can't figure out how to install my external HDD through the PCMCIA port, as the system doesn't pick it up automatically. How should I go about setting this up?
Incidentally, I originally stopped using the dual boot, as it seemed to slow the system down a great deal, but am now trying out the system commander on your CD, however after choosing to boot into Linux, it then goes to the LILO option. Is there anyway to get rid of LILO so that it only uses the System Commander menu?
Dr Bruce J. Ella, by e-mail

A Most PCMCIA CD-ROM drives are ATAPI and have a IDE interface on the card. Almost every Linux distribution will support IDE on PCMCIA, so you may want to try it out with something other than Corel. Corel isn't the most appropriate distribution on a laptop. Something like RedHat, Mandrake or SuSE is a bit cleaner. If it still doesn't want to pick it up, it may be worth copying the CD to the Windows part of the disc, then installing from there, so you can set up PCMCIA properly later on.

As for System Commander, you can set up LILO so that it doesn't display a prompt by removing the 'prompt' line from lilo.conf and running /sbin/lilo as root. It's always nice to have the flexibility to boot multiple kernels easily, so LILO is quite handy to keep around.

Win modems

Q **I wondered whether some of the software drivers for Win modems were now stable enough to do a piece in the mag on how to get a Win modem working under Linux. I think that I've found a manufacturers patch for mine and don't know what to do with it. Following the press articles, it seemed that whilst Linux are going to be here for a while, especially if low-cost consumer boxes catch on. At the moment, my manufacturer is only supporting OEMs, but it looks like the software at least is available.**
Paul Hewson, by e-mail

A It greatly depends upon the chipset used. Lucent have binary only drivers available for their chips, they don't always work and aren't particularly stable with more recent 2.2 kernels. There are also unofficial PCTel drivers, although they don't actually do very much at the moment. While they may work, to some extent, if you rely on the modem for anything, you will probably be better off getting a hardware based one. Even when they are working, software modems are never as reliable as the real thing. PCP

Dave Coulson
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We can help!

→ Got a Linux problem? We can't answer questions privately but we're pleased to answer your questions through these pages.
→ E-mail your questions to: Linux Q&A at dcoulson@pcpmag.co.uk and we'll try to help. Alternatively, send them to Linux Q&A, PC Plus, 30 Monmouth Street, Bath BA2 3BW.

Mediator: PART TWO

Digging deeper in multimedia with Mediator 4

PCPlus SEE YOUR SUPER DISC

Adding sophisticated features to your multimedia project is easier than you might think. **Mat Broomfield** shows you how

Last month we showed you how to create the basics of a multimedia presentation. We created a small project and offered the user a number of choices so that they could navigate the presentation in a non-linear manner. However, our presentation was pretty basic, and there's much more information that we could add to make it more useful to a real user, and there are more sophisticated techniques that we can employ to make the presentation more sticky. In case you're not familiar with the term, 'stickiness,' it is an Internet expression that describes a site's ability to retain a viewer's interest for as long as possible.

There are many ways to achieve stickiness, but it comes down to making the site more engaging. You can do this by using graphics, music, lively design features and far more besides. You can also make a site more engaging by giving the viewer little 'rewards'. These can come in the form of humorous or unexpected events, or simply as valuable information.

All the things that combine to make a good Web site apply equally to a multimedia presentation. You still want to hold the viewer's attention, but if your project has been provided on CD-ROM, your audience doesn't have to wait for long downloads, and they won't have their mind on the phone bill.

So, as we complete our project this month, we'll be adding useful information, polishing the presentation, and creating some additional engaging content to hold our audience's attention. By the end of this tutorial, you'll have the ability to generate a stand-alone multimedia project that can be distributed by Internet, CD-ROM or floppy disk. Follow along as we show you just how easy multimedia authoring can be.

↑**Is it Mediator or Medi8or? Apparently, the creator of the sample projects is as confused as we are! We'll stick with Mediator for this Masterclass**

The story so far

Last month we created some basic graphics and a simple menu system, now we're going to add a little bit of text telling people about the holidays we offer. Text can tend to be a bit indigestible on its own, so, we're going to use a pictorial background and introduce the page with a simple animation to generate a sense of zest and anticipation.

We'll start by opening the page list, so click the List button in the Standard Toolbar. Click on the Main Page entry then click the Copy button at the top of the Page List box. Click Paste and a new page will appear called Main Page01. If this entry is not already highlighted, select it and click the Rename button and change it to 'About Our Resorts'. You've created an identical copy of the main menu page.

Close the Page List, then click on each of the three buttons in turn and delete them. This exercise was simply a quicker way of duplicating a page with the background image.

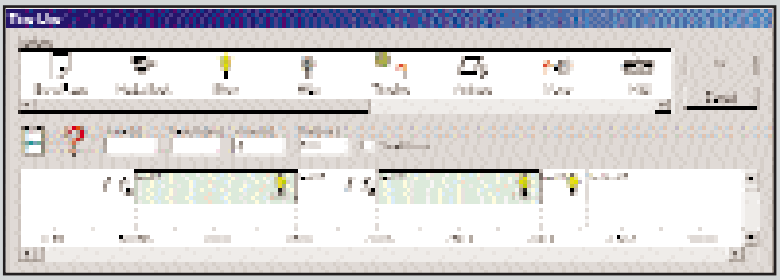
Create a text box on the page, about 25% of the page high, and as wide as the page. Type into it, 'About Our Resorts', then select a decorative font, change the text colour to dark maroon, the font size to 60 point and set the adjustment to Centre. Position the box at the top of the screen then, create a button labelled 'Return to Main Page' and centre it near to the bottom of the screen. Assign a Mouse Click event to the button using the Go To Page action that returns the user to the Main Page (see last month's Mediator tutorial to learn how to assign events and actions). Create another text box as wide as the screen, which starts just below the title, and stops just above the button. Set the Adjustment to Centre, the font size to 36 and the text colour to royal blue, type in some text that describes the resorts. It doesn't matter what you say but you'll need to create about two screen's worth. If you don't want to do the typing, cut and paste some random text from any document.

Now that you've constructed the basic shape of the page, you need to refine it. Right-click on the title and deselect the Show Object option to hide it. Repeat the process for the button and the big text box. Right-click the main text box and select Properties, click the Text tab and select the Scrollbar option. This places a scrollbar in the text window if there's too much text in it to display in one go. We'll refine it further on the next page. Ready? Let's go!

PCPlus SUPER DISC **PATH: \prog\mediator**

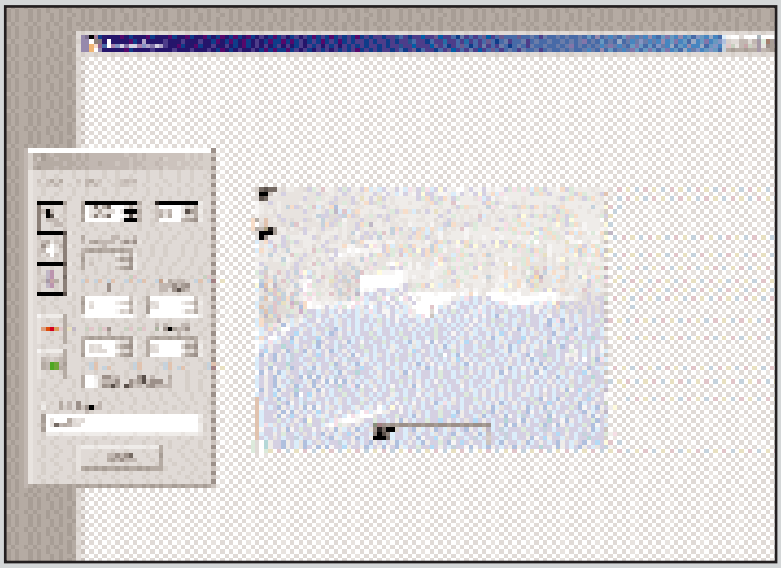
Multimedia, With a Side-Order of Interactivity

You can use invisible empty boxes to create 'hot spot' areas for events to take place, or for interactivity to occur. Here, we'll show you how to do it, and we'll also walk you through the principles of key-frame animation before introducing transparent objects. Finally, we'll use the 'Page Ready' event to create actions that occur without user interaction



1 We've created three boxes that are all hidden. Go to the main menu bar at the top of the screen and from the Page menu select Events. Drag the Page Ready event into the script panel. Add the Timeline action after it. This is a new action that we haven't used before. It enables us to trigger events at specific times, rather than when the user does something. You'll notice that a separate Timeline requester appears showing the passage of time in fractions of a second, offering you a choice of actions that can be performed at any time. Drag the Animate action and place it on the timeline at 500 milliseconds. The Animate window opens. Click the Zoom button to zoom out. This enables you to bring objects onto the screen from outside.

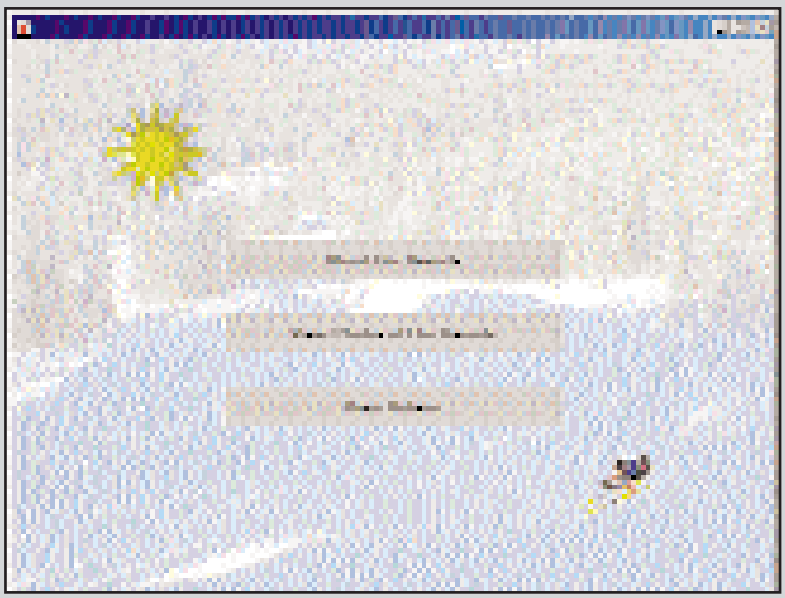
Mediator uses key-frame animation. In other words you specify the location of an object at certain points in time, and Mediator calculates the movement required to get the object from one point to another in the time stipulated. You use the Add (+) symbol to add key-frames. In this instance, we're creating a simple scroll, so there are only two key-frames – the start and end points. We'll start by specifying the object to be animated. Click the little grey box beside the word object and select the Text01 entry, which is our page title. Click OK.



2 Click the Add symbol then click on the screen in the striped area just outside the top right of the background picture. This places the first key-frame. Now click on the screen at the top left of the background picture to place the second key-frame. Change from the Add tool to the Select (arrow) cursor, then select the red square that denotes the second key-frame. Drag the square around until the outline of the text box fits the width of the background image, and is positioned at the top of the image. Close the animation box and you'll find yourself back at the timeline. The animation that you've created is shown in pale green. Drag the Show icon from the Timeline's Actions list and drop it onto the timeline immediately after the animation. This will ensure that the title remains visible after it's been moved into position. Select the Text01 object then close the show object dialog.

Now move to two seconds on the timeline, and use the animation action to scroll the main text box (Text02) up from below the screen, then add the show action to display it permanently.

Finally move to about 3.25 seconds on the timeline and add another Show action. This time use it reveal the button. In the Show Object dialog, change the Effect to Tiles, and reduce the Tile Size to 5. Close all open dialogs and test the animation to see how it works. The title should slide onto a blank screen from the right, then the text should slide up from the bottom, then the button should materialise below it.



3 We're going to add a little interest to the main page so return to it now. Create a small square picture box anywhere you like. Make it about three times the height of one of the buttons and if you're using our sample images import the file skier.tif into it. Right-click on it and select Properties. Click the Color tab and select the rainbow striped 'Select Transparent Color' button, then click on the white background surrounding the skier you just imported. This defines white as transparent, so that the skier looks right against the background. Now click the General tab and deselect Show Object.

Go to the Page menu and create a new event. Select the Page Ready event then add an Animate action. Select the skier object then set up five key-frame points: one off the screen to the right level with the bottom of the tree-line in the picture, one underneath the buttons with the picture box just touching the bottom right corner, one off the screen at the bottom left corner, another directly below that, and the final one just off the page at the lower right corner of the picture. In the Animate dialog, go to the Type menu and change from Normal to loop. The last and first key-frame markers should be joined, creating a continuous loop of animation.

Repeat the entire animation process, substituting the sun.tif image for the skier. You'll need to add a second Animate action to the same Page Ready event. Create an arc that moves over the top of the menu buttons, almost like the sun was moving across the sky. Remember to set four of the key-frames outside the area of the background picture so that the sun can return to its start position unseen.

Toolbars, palettes and buttons

Getting to know the Mediator interface

The Toolbar
You'll use the main toolbar for familiar operations such as cut, copy and paste. You can also save and open projects, manage page behaviours, and adjust colour profiles from here

The Tools Palette
This holds the various objects that you can drop on to a Mediator page. Once you've dropped a component on to a page, you can then tweak numerous properties using its individual properties option

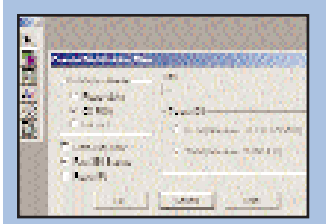
Quick Tips

TWO WAYS OF CREATING A SLIDESHOW

Multiple pages, or imported video?

There are two possible methods for creating an auto-running slideshow in Mediator. The first is to create a lot of pages, each with a separate picture on it, then using the timeline function, you can make each page pause for a while – say 3 seconds, before using the Page Event to trigger a Go To Page action, which then displays the next page.

If you own any kind of animation or video software, a less tiresome option is to create a slideshow in that package, by importing the pictures and sequencing them one after the other. You can then save the video as an animated GIF or an AVI file. It's easier and less complicated to import and control a single video within Mediator, and you can still navigate it with frame-by-frame accuracy.



Whatever method you choose, you will have to bundle your application up for distribution - see our guide to help you make your mind up!

Video editing

Let's add that video referred to on the last page. Create a page and call it Video. Create a background using the 'background 2.jpeg' image. Use the Video tool in the toolbar to create a window to place the video in. Load the file 'video.avi' (or any video). Mediator can handle all formats supported by Windows Media Player.

When the video is loaded, it's probably resized. Rather than playing the video smaller than its proper size, right-click the video window and select Adjust Size: Mediator automatically sizes the window to the original dimensions of the video.

Right click on it again and select Properties, then click the Video tab and deselect the Auto Start option. Click the General tab and deselect the Show Object option.

Go to the main menu and select Events under the Page menu. Create a page ready event and add the Show action. Reveal the video01 object we just created, but use the Zoom Effect with a 1000 millisecond duration to reveal the image.

Create a button labelled Return to Main Page. Edit its events so that it takes you back to the main page. Position it centrally near the bottom. Create another button, this time labelled Play. Create a new Mouse Click event and drag the Media Search action into the window and set it to use the Video01 object. By leaving the Media Seek action set to 0, it resets the playback position in the video to the start. Now drag the Start action into the script area and place it to the right of the Media Seek action. Specify the Video01 object again. Close the Events window. Every time the Play button is clicked, the video will restart from the beginning.

Create yet another button and call it Pause. Make a copy of the button and paste it in exactly the same place as the original. Change the text on the copy to Resume then add a Mouse Click event so that it uses the Start action to play the object video01. Add a Hide action that conceals the Resume button (button04) and a Show action that reveals the Pause button (button03) when the Resume button is clicked. Hide the Resume button by right-clicking on it and deselecting the Show Object option.

Open the Object list (via the Standard toolbar), and select Button03 (the Pause button) and select Local Menu in the Object List. Select Event and add a Mouse Click event. Insert the Stop action, and apply it to the Video01. Also add the Hide action, and use it to hide the Pause Button (button03). Add the Show action and use it to show the Resume button (button04). Phew!

Because the video is not rewound in between selecting Pause and Resume, playback will resume from where it left off unless restarted from the beginning with the Play button.

Arrange the video and buttons neatly on the screen and you're done here. Return to the main page and define a Go To event for the Video button that leads to the page you just created.

Sharing your work with others

Now that you've completed your project, you'll want to share it with the world, and to do that you'll need to find a way of transferring your files onto other computers. There are a few distribution methods. The simplest method is using a floppy disk: it's a media that everyone is capable of accessing because every computer comes with a floppy disk drive. The major downside though, is that floppy's can generally only hold 1.44MB of data each, so a large project with lots of video will require many, many disks and will take a lot of time to fill them.

A more contemporary alternative is to place your project on the Internet, from where anybody (or just invited guests) can view it. In this case, the greatest limitation is bandwidth. Most people connect to the Internet using a 56k modem, so placing dozens of megabyte's worth of multimedia on your site is likely to scare most of them off – and that always supposes that your ISP provides you with that much space in the first place!

The final, and most versatile, problem-free solution is to use CD-ROM. CD writers are commonplace now, and you can buy one for little more than £125. CDs offer many advantages to the multimedia producer: they have a large capacity, they're fast and anyone with a PC powerful enough to run a multimedia presentation certainly has a CD-ROM with which to access it in the first place.

↑Mediator allows you to easily embed video objects in to your presentations, creating that extra bit of visual 'spice' for your viewers to feast their eyes on

←When your presentation is ready, you can bundle it up and create an installer with Mediator's distribution tools

→16-bit or 32-bit?

Backwards compatibility is important, but how far back should you go?

It's important that you know who will be viewing your multimedia project, or more importantly, on what platform. If they will be using Windows 3.1, then you need to remember that that operating system does not recognise file names longer than eight characters, with a three character extension, so rename your files accordingly if needs be.

If your potential audience may be using 386 processors (Lord have mercy!), then you can make their lives a little easier by including JPEG decompression tables with your distribution files. Or, you could make their lives a lot easier by pointing out that they could buy a second-hand Pentium PC for about £100.

Distributing your files via floppy disk

Mediator provides a virtually automatic method of generating the required files for distribution. Before you can use it, you need to decide whether or not you want to sacrifice speed and versatility in order to make your project accessible to people who are still running Windows 3.1. It's not recommended, go to the Document Menu, select Properties and deselect Do Not Allow the Use of Long Filenames.

Now go to the File menu and select Create Distribution Files. A requester will appear offering you several options. At the left, you can specify the target distribution media. We've already talked briefly about some of the considerations of each, so simply select Floppy Disks.

At the lower left are three options that pertain to the way that the project is configured. If space is a consideration, or the intended recipient already has the Mediator viewer, you can select the Data Files Only option. This option does not distribute the viewer program with your project. Your audience can download the viewer from the Internet if needs be.

The Fast 386 Startup option is unlikely to be a consideration because it only applies to those people who are viewing your project on an ancient 386 PC, but in case you do wish to consider them, it's best to leave this option selected because it generates a JPEG picture decompression table which is used to compensate for the lack of a maths co-processor in the 386. It prevents the program from having to create one when the project is run, which could be a lengthy process.

The Reset IPJ option controls whether or not the program overwrites the list of files that are used in a project each time a new distribution file is saved. If this option is selected, then the previous file will be erased and a new one generated. There's little good reason not to select this option, so do so now.

At the right of the requester, you can specify whether you wish to output for a 16-bit or 32-bit operating system. The former makes your project accessible to all PC owners, but carries with it some additional penalties and considerations. Unless you know that owners of 16-bit operating systems such as Windows 3.1 will be running your project, we suggest that you leave it at 32-bit selection.

The final duty in this requester is to give your project a name, which you can enter in the title input field. Click OK to continue.

The next requester is where you control the actual files that will be produced, the way that the installation will appear and where everything will be stored. You could simply click the Make Files button and the program would proceed with no further input.

The floppy drive capacity is set to 1.44MB, which is the standard for a high-density (HD) disk. The Default Compression is set to high (so the files occupy less space but take longer to compress and decompress). The program needs to build images of the floppy disks it's going to write, and it does this in the temporary directory. With this in mind, the directory needs to be large enough to hold your entire project before it's written to disk, so choose a drive with enough space.

When the image is being installed onto the target computer, Mediator displays a blue graduated background image. However, you can easily substitute this for a BMP format image of your own choice by clicking the first button and selecting a different file. A 16-colour image is probably your best bet. When you click to change the background image, you can also modify the text that's displayed on top of it.

You can modify the default destination directory (the recipient's hard drive where your program will be installed) by clicking the Destination Directories button.

Once you've made any modifications to Mediator's default settings, click on the top button labelled Build Installation Files, then click the Make Files button to create the full set of images on your hard drive. When the process is completed, click the top button labelled Copy Installation Files. Type 'Format.com A:' in the Format Program input field then click the Copy button. Mediator will format the floppy disk in drive A (erasing any data on the disk), then copy the files to it that you just created. Change disks when prompted and your project will soon be complete. To install and run the project on another computer, simply run the file 'Install.exe' from the first disk. PCP

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PCPlus

NEXT MONTH

We start a whole new series with 'Real' streaming media

Javascript techniques: PART FOUR

OOPs, I did it again

Paul Stephens creates a class divide among Javascript objects

PCPlus SEE YOUR SUPER DISC

↑On this month's SuperDisc you'll find an HTML page showing all the JavaScript object-handling techniques in action.

While JavaScript may not be a true object-oriented language, it is heavily object-based with everything from strings to arrays implemented as objects, and manipulated via properties and methods. Like all modern scripting languages, it can also handle the built-in objects exposed by applications, such as window and its children in Web browsers. However, unlike most dialects (including VBScript), JavaScript goes a big step further by allowing you to create your own object types, or classes.

User-defined object classes have been part of Javascript since day one, and are supported by all JavaScript-enabled browsers. They really do make programming simpler and more reliable, and once you've used them you won't want to go back to the old techniques.

Why use objects?

The advantages of Object Oriented Programming (OOP) can be summed up in three words – Encapsulation, Inheritance and Polymorphism. JavaScript supports all three features.

Encapsulation means building self-contained objects which have their own data storage (properties) plus the code to process it (methods). A simple example illustrates its benefits. If a game supports two player, then in a non-OOP system you have to make up global variable names such as player1_score and player2_score, and write functions (such as updateScore(playercode)) which are careful to use the right player's variables each time...

Encapsulation also makes objects inherently re-useable.

Construction kit

JavaScript has a built-in root object class called Object, which acts as a blank sheet object definition. All intrinsic and user-defined object types are based on Object (note that we're just dealing with JavaScript objects here, not those exposed by browsers).

To create a JavaScript object, you call a constructor function, using the new statement. A constructor adds properties and methods to the basic Object definition, and JavaScript comes with a set of constructor functions for its intrinsic object types. Here's an example:

```
myDate = new Date()
```

Here Date() is the constructor function, and its job is to give the blank object a value (by default the current date and time), plus a set of date-oriented methods. The variable myDate becomes a pointer to the newly-built object, so you can now say:

```
var dString =
myDate.toGMTString()
```

and so on.

JavaScript's intrinsic constructor functions are built into the language interpreter, but you can also write your own, which do the same job of adding properties and methods to Object. A user-defined object constructor is just an ordinary JavaScript function, which you can embed in the ‹head› section of your page, or call from an external script linked in by a ‹script src="myscript.js"›‹/script› tag. Here's an example:

```
function
Player(playerNameParam,
startingScore) {
  this.playerName =
playerNameParam
  this.score = 0
  if (startingScore !=
null) {
  this.score =
startingScore }
  this.showDetails =
showScoreDetails
}

function showScoreDetails()
 {
  alert(this.playerName+"
has scored "+this.score+"
points")
}
```

where Player() is the constructor function (we'll deal with showScoreDetails() later).

To create a new object of this type (strictly speaking, 'instantiate an object of this class'), you use a new statement, like this:

```
player1 = new Player
("Jim")
```

This makes JavaScript create a new blank object (with player1 pointing to it), then execute the function Player(), which gives the object extra properties and methods. Within Player(), the blank object is referred to as this, so

```
this.playerName =
playerNameParam
```

adds a property called playerName to the object, and assigns it the value supplied in the function call's 'playerNameParam' parameter.

Next, Player() creates a property (this.score) which can be overridden by an optional parameter. Having initialised this.score to zero, it checks to see if a value was supplied for the startingScore parameter (startingScore != null). If so, it overwrites this.score with the parameter value. So if a new Player() object is created like this:

```
player2 = new
Player("Fred", 500)
```

then Fred will start life with a 500 point bonus.

Finally, this statement in the Player() constructor function:

```
this.showDetails =
showScoreDetails
```

adds a custom method to the new object by creating a pointer (showDetails) to the function showScoreDetails() (note that you don't include the () brackets after the function name).

The pointer name becomes the custom method name, so having instantiated a Player() object, you can say

```
player1.showDetails()
```

as well as accessing its properties like this:

```
player1.score += 10
```

Like the Player() constructor function, the showScoreDetails() method code uses 'this' to refer to the object on whose behalf it's currently executing. If it's called via player1.showDetails(), then its reference to this.playerName is automatically resolved as the

More Object-Building

Add properties and methods to the Object class on the fly

You don't have to use a constructor function to create a custom object; instead, you can create an instance of the basic Object class, and add properties and methods to it 'on the fly'. Here's an example:

```
feature = new Object()
feature.magazine = "PC Plus"
feature.article = "Web Masterclass"
myObj.showDetails = showDetails
```

This technique is a tidier alternative to creating lots of global variables in a page, and really pays off if you're writing cross-window scripts – instead of endless references to window.opener.article and so on, you can do a single pointer-hookup like this:

```
rFeature = window.opener.feature
```

then refer to 'rFeature.article'. If you change the relationships between the windows, you only need to change the hookup statement (foe example 'rfeature = window.parent.otherwindow.feature') and everything else will work.

You can also dynamically add properties and methods to existing objects (intrinsic and custom). If you've created this object:

```
myDate = new Date()
```

you can now say

```
myDate.comment = "The time
this player started playing
was "
```

This only adds a comment property to that particular object (myDate) – other Date() objects (such as myOtherdate) won't have one. However there is a way to add properties and methods to all objects of a particular class. Here's an example, using the Player class from the main text:

```
Player.prototype.team = "No
team selected yet"
Player.prototype.showTeam =
howTeam
```

Now every playerObject object (even those already created) will have a .team property (with a default value) plus a showTeam() method. This technique is useful for adding application-specific attributes to 'boilerplate' object constructors stored in a .js library file.

You can update the prototypes of intrinsic object classes too, for example:

```
Date.prototype.calcUKDate St
ing = calcUKDateString

function
calcUKDateString()
{
return ""+
  this.getDate()+"/" +
  (this.getMonth()+1) +
  "/"+this.getFullYear()
}
```

Now every new Date() object will have a calcUKDateString() method.

Mighty morphing

How to make polymorphism easy

Polymorphism means the ability of an object to present a standard interface to other code, but to behave differently depending on context. A game might store its scores either locally, or remotely on a multi-player server. Either way, its Player() objects would expose an updateScore() method – calls to this method would be the same in both versions of the game, but the code which supported the method would be different.

Polymorphism is easy to achieve in JavaScript using a number of methods, one of which is by conditionally setting method pointers, like this:

```
function Player() {
  if
(controlObj.isRemote()) {
// user-defined method call
  this.updateScore =
remoteUpdateScore
  } else {
  this.score = 0
  this.updateScore =
localUpdateScore
}}
```

To make polymorphism easier to achieve, it's best to make your objects fully encapsulated, by using method calls (such as updateScore()) instead of allowing other code to access their properties directly.

.playerName property of the player1 object. If the call is player2.showDetails() then it's resolved as player2.playerName.

If the code for a method is short, there's no need to place it in a separate function. Instead, you can build it into the constructor function, like this:

```
function Player() {
  ...
this.updateScore = new
Function("points, display",
"this.score += points; if
(display)
{this.showDetails()}")
...
}
```

This creates a function with two parameters (points and display), and two JavaScript statements.

Objects within objects

An object constructor function can itself use the new statement to create another object, which becomes a property of the object it's building. For example, to record a player's scores in successive rounds of a game, you could add this statement to the Player() constructor:

```
function
Player(playerNameParam,
startingScore) {
....
  this.roundScores = new
Array()
....
}
```

Now each new Player() object will have a .roundScores property, which is actually a JavaScript array. It will support the standard array syntax, properties and methods, so you can say:

```
this.roundScores[current_
round] = this.score
j =
player1.roundScores.length
roundString =
player2.roundScores.join(",
")
```

and so on.

Inheritance

You can also create new object types based on existing types (intrinsic and custom). Here's an example:

```
function UKDate() {
  d = new Date()
  d.UKDateString = ""+
  d.getDate()+"/" +
  (d.getMonth()+1) +
  "/"+d.getFullYear()
  var j =
d.toLocaleString()
  d.timeString =
j.substr(j.indexOf(":")-2,
8)
  return d
}
```

This constructor function creates a new JavaScript Date object (d), and adds two custom properties (.UKDateString and .timeString) to it. A new UKDate object, created like this:

```
localDate = new UKDate()
```

will support all the intrinsic Date properties and methods. However it will also have two extra properties, so you'll be able to say:

```
timediff =
localDate.getTimezoneOffset
() // intrinsic Date method
alert("It's
"+localDate.timeString+" on
"+localDate.UKDateString)
// custom properties
```

and so on.

The UKDate() constructor behaves quite differently from the ones we've seen so far. Instead of augmenting the new blank object, it creates another object of an existing class (the Date object 'd'), augments that, then passes it back via a return statement. There's no use of the this identifier because it's d that's having the extra properties attached to it. The original blank object is effectively discarded.

You can also add custom methods to an object created in this way. Here's some code:

```
function UKDate() { //
constructor
......
d.showTimeStamp =
showTimeStamp
return d
}

function showTimeStamp() {
  alert(this.timeString+"
on "+this.UKDateString)
}
```

Note that the code in showTimeStamp() does use this object identifier. You'll soon be wondering how you ever managed without custom objects! PCP

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PCPlus NEXT MONTH

Browser hosted objects and data submission forms and processing

FRONTDESK

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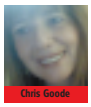
Unmetered Internet chaos

As users try to find reliable services, others fight back with online support

AltaVista's originally much-praised move to launch unmetered Internet access to the masses has ended in turmoil. Managing director Andy Mitchell was forced to resign when it was revealed that there was to be no service at all – despite 270,000 users waiting for it to be activated. AltaVista pre-announced its service and disguised delays as part of its plan for a structured rollout. The search engine company blamed its failure on the lack of flexibility in UK telecommunications – especially the way BT still controls the last mile of cable to consumers' homes (the local loop). But BT claimed that AltaVista should not have announced a service when it had no agreements in place to run it.

Ezesurf has also closed down after its service became overloaded – often by users not even authorised to log on. Its managing director apologised for the closure by posting a voluminous message at **www.ezesurf.co.uk**, now deleted. And Ezesurf staff have been telling their side of the story at **www.eezypeezy.net**. Although recent Internet services may have been unmetered from the consumer's point of view, the ISP still has to pay a metered rate from the user's exchange to the free dialup number. Ezesurf closed when it did because a bill for around £2 million is thought to have arrived from its telecoms supplier.

All of this comes on the back of the problems at LineOne, CallNet and Breathe reported last month. At the time of writing, LineOne was waiting to hear whether it was going to be dropped from the Internet Service Providers Association (ISPA). This follows the closure of its unmetered service that users could freely access – as long as they made at least £5 of voice calls. But users are now starting to fight back. Chris Goode (under the pseudonym of Sanfire) runs the Unmetered Support Board at **http://pub22.ezboard.com/btheusb**. This has sections for all the main unmetered services, including Freeserve, TheFreeInternet.Net, RedHotAnt, ClaraNet, NTLWorld, Totalise and BT Internet.


Chris Goode

"When you think of how many unmetered users there are and how few of them know of this resource, I feel sorry for them when their connection is bad and Web sites are down. Support can be poor and if these users don't know anybody else using the same service, they might think their PC is to blame"

This was created out of a previous discussion group specifically aimed at the RedHotAnt service – set up by Chris and another user. This was known as the RedHotAnt Unofficial Support Board.

But after a short while, the other user wanted to close the service and move on to other projects. Chris told PC Plus: "The reason for moving the USB was that if RedHotAnt ever disappeared, the new board would be a resource for all users of unmetered ISPs. For this reason, I changed the URL and the name of the board."

Chris went on "When you think of how many unmetered users there are and how few of them know of this resource, I feel sorry for them when their connection is bad and Web sites are down. Support can be poor and if these users don't know anybody else using the same service, they might think their PC is to blame – or that the service has closed down. I am the worst about complaining on the board, as I always say if you bought a television and it only worked some nights and not others, you would complain to the manufacturer and they would sort it out. Unmetered services should not be allowed to get away with signing up yet more users until they have sorted out their current problems."

Chris praises the moderators on the USB, pointing out that their role is helping other users – rather than just policing the service. Although the USB is still mostly accessed by RedHotAnt users, the other areas were beginning to be utilised at the time of writing.

Unmetered ISPs are likely to continue on a rollercoaster ride for some months yet – BT's local loop is not being unbundled until next summer. Until this happens, offers from most ISPs are going to still be very much tied to BT.

➔Poor Internet services

What can you do?

➔If you haven't signed up yet, get on to the Web and find out about the company's level of service before you commit.

➔Your first port of call should be your ISPs technical support – there may be a genuine problem it can solve.

➔Some users may wish to use two unmetered services.

➔If you're using multiple ISPs, consider getting an e-mail account that you can access from anyone of them.

➔A traditional pay-for ISP is advisable for those requiring a guaranteed level of service.

➔Check newsgroups and Web sites for other users expressing similar concerns.

➔Always complain in writing and inform the ISP's local trading standards office if you get consistently poor service.

SOFTWARE NEWS

NEW WINDOWS 2000 FLAWS

Further Windows 2000 security flaws have come to light. An unchecked buffer in the 'Still Image Service' means a user logged on locally is able run malicious code that could raise their privilege level on the system. This service is not installed under a default installation unless an appropriate hardware device is found – such as a scanner. A patch is available to fix the problem and further information can be obtained from **www.microsoft.com/technet/security/bulletin/fq00-065.asp**. This follows hot on the heels of a flaw linked to the Service Control Manager. This creates named pipes for each service that starts on the system. Malicious code could predict one of these and create a named pipe that could impersonate a user of the system. A patch was also released for this issue and further information can be obtained at the same main URL, document fq00-053.asp.

NETBIOS FLAW SINCE WINDOWS 95

A vulnerability has also been discovered in Windows' NetBIOS support. According to PGP Security's Covert Labs, a hacker can insert and flush dynamic cache entries, as well as overwrite static entries. This allows the hacker to infiltrate a local network and redirect NetBIOS names to any other IP addresses. This problem has been given a high risk factor by Covert Labs and more information can be found at **www.pgp.com/research/covert/advisories/045.asp**. Microsoft has said that there will be no patch for this problem – because of the unauthenticated nature of the NetBIOS protocol. The above URL gives several suggestions on how users can configure their network settings to minimise the risk.

LIFE OF GRIME

Chocolate bars and biscuits are the prime culprits in clogging up your keyboard, a survey conducted on behalf of AOL UK has revealed. The company collected the dust, dirt and crumbs from keyboards in a typical office over the course of a month, weighing nearly 2g on average. 56 per cent of the debris came from snack food, such as chocolate bars and biscuits. Other top cloggers were corn flakes (15%), boiled sweets (15%) and noodles (7%).

It all seems to point to a diet of cereal in the morning, a Pot Noodle for lunch, and rounded off by chocolate in the afternoon – yum!

Pentium 4 almost here

➔But 1.13GHz Pentium III is withdrawn

Further details of the forthcoming Pentium 4 processor were available at the recent Intel Developers' Forum (IDF) in San Jose, California. Its release will mark the first major overhaul of the Pentium family of processors since the Pentium Pro more than four years ago. And although the chip is expected to launch in the next few weeks at 1.4GHz, the Forum was shown a 2GHz model.

The Pentium 4 will have a 400MHz system bus plus the ability to support six instructions per clock cycle. And a set of 144 extra instructions dubbed 'Netburst' will provide on-chip support for 3D graphics, streaming video, sound and encryption services. The new chip is likely to carry a significant price premium in its first few months, and it may also suffer from short supply – something that has characterised recent Intel launches. For the chip to be seen in the best light, it will be crucial for Intel to get software support for Netburst.

The IDF was also shown a 1GHz version of the high-end Xeon processor. This follows Intel's dropping of the 800MHz model after business users complained about the number of upgrades they were having to perform. But it was not all good news for Intel – its latest Pentium III was withdrawn after it was found to fail key Linux software tests. Being a new chip, the consequences were not as serious as when flaws are found with chips in wide circulation.

Windows 95 users lose out in Millennium pricing

➔Office 10 is also out of bounds

Many Windows 95 users did not upgrade to Windows 98 because it appeared to be a minor update – especially as upgrades to Internet Explorer 4 and 5 were freely available. However, some users might now regret that decision. Windows Me (Millennium Edition) launched on 14 September and as is now traditional, a few shops opened at midnight to allow eager users to get on with their upgrades. Unfortunately, those purchasing Windows Me will have found its pricing to favour Windows 98 users.

The full retail Windows Me pack costs £139.99 – for those with nothing to upgrade. And the upgrade pack for Windows 95/98 costs £79.99. But a special promotion lasting until the end of the year allows Windows 98 and 98SE users to upgrade for £39.99. Microsoft had claimed that Windows Me would be the 'cheapest ever Windows' – despite the fact that Windows 98SE could be obtained for a fixed handling fee. But even the promotional price looks high – especially considering that users can update their browser and Media Player for free.

↑**Is £79.99 too much for an upgrade?**

Windows 95 users also lose out when it comes to the next generation of Microsoft Office. A beta of 'Office 10' has now been distributed – but this only supports Windows 98 and above. This is an important Office upgrade because it will be the last major update before Office.Net is released as part of Microsoft's .Net online initiative. Office 10 is a good indication of the things to come in Office.Net, including much expanded XML support. Microsoft denies that there will be a problem, suggesting that most users will have upgraded from Windows 95 by the time Office 10 is released next year.

Sony launches low-cost PDA

➔Sony uses Palm operating system for CLIÉ

Sony is planning to launch a PDA based on Palm's software. However, the initial version will only include a black and white display because of supply problems. Early prototypes included a colour screen. The new device is called the Sony CLIÉ (Communications Link Information Entertainment – pronounced Klee-ay) and is expected to ship with 8MB of memory and an 8MB removable Sony Memory Stick. Several multimedia applications are expected to be supplied, as well as a USB docking cradle and a one-hand scrolling facility. Calendar, address book, notes and to-do items can be synchronised between the Sony CLIÉ and Palm's Desktop organiser software, Microsoft's Outlook and Lotus Organiser. UK availability has not yet been announced but the CLIÉ is expected to sell for around £300.

↑Memory plants are taking extra security precautions.

Memory-related crime is back

➔But prices appear to be stabilising

Following our report in our last issue on the rising price of memory, an old problem has returned to haunt the market – crime. An attempted raid on the Wiltshire warehouse of a company called Memory Plus took place at the end of August. But an alert employee spotted the thieves and blocked their escape. He was attacked and taken to hospital and the thieves made off. Three days later, intruders returned to the site and disabled telephones, external lighting and alarms. But they also escaped after being disturbed. The two foiled raids come on the back of a £60,000 raid on a Memory Plus truck in June.

At the time of writing, memory prices appeared to be stabilising.

HARDWARE NEWS

LOGOS FOR NOTEBOOK LIDS

ACI has announced a new service called Corporate or Personal Imaging. This allows the lids of notebook computers to carry colours or logos – both for personal taste and, more importantly, security. The service uses a specialised technique developed in Scandinavia that employs multiple layers of colouring materials and two layers of lacquer. You can get more information from **www.aciplc.com**.

4I LOOKS FOR RAMBUS CHANGES

Discussions are underway about modifying Rambus' core, with the aim of reducing the high cost of manufacturing Rambus DRAM. Rambus, Intel and other companies are looking at ways of reducing the number of banks inside the core. This could allow higher yields to be obtained because the chips would share some similarities with SDRAM. The initiative has been dubbed 4i and has been given some priority as Intel gears up for the Pentium 4's launch.

NVIDIA GOES HIGHER

Graphic cards continue to be one of the major battlegrounds in the PC performance stakes. And nVidia has just announced its GeForce 2 Ultra, the first card to support DDR-SDRAM – which increases bandwidth by 42%. And by utilising the latest drivers, nVidia claims a speed improvement of more than 100% for 32-bit colour, compared to the GeForce 2 GTS. Other functions are likely to be around 25 per cent faster.

TFT SCREENS GO DOWN

TFT screens are likely fall in price over the next few months, as new Taiwanese manufacturers start to undercut existing Korean suppliers – by as much as a third. By early 2001, the TFT screens used in notebook PCs are expected to be as much as 50% cheaper than they are today. However, the cuts might not translate into massively reduced prices for notebooks – newer hardware components may absorb much of the price drop.

MITSUBISHI FLASH DRIVES

Mitsubishi has launched a new range of solid-state Flash drives. These utilise the company's 256Mbit flash chips and connect to standard hard drive cables and a 5V power supply. With no moving parts, the company claims unprecedented reliability. But the prices may make most users think twice – £2,000 for the 1.2GB model.

HP ANNOUNCES LASER-LIKE INK-JETS

Hewlett-Packard is aiming to further bridge the gap between ink-jet and laser printers. Its new Business Inkjet 2200 and 2250 models come with performance similar to that of many laser printers. The company claims printing speeds of up to 14 pages per minute for colour, and slightly more for black and white. The print heads use smart chips to send alerts before they need replacing and they align themselves automatically. The heads are also designed to last one and a half years or 16,000 pages (black) or 24,000 pages (colour). HP believes these models will produce colour prints at half the cost of colour laser printers.

↑New Business ink-jets from HP.

The printers have dual 96MHz processors and slots for up to 88MB of memory. And the high end 2250TN comes with HP's JetDirect 600N print server. "Combining robust networking, affordable colour and business-focused support, HP Business Inkjet printers are a new class of printers that will reinforce HP's colour leadership in the office," said Han-Tian Phua, general manager of HP's Business Printing Division.

The 2200, 2500 and 2500TN printers are expected to ship in the UK in November. US pricing is $499, $699 and $999 respectively. Further information can be found on the company's Web site at **www.hp.com**.

A BARGAIN DOWN IN THE JUNGLE

Something was stirring down at Jungle.com during the summer. One credit insurer withdrew its cover and 20 staff were made redundant. Although rumours of a takeover were denied, it was soon revealed that the service had been sold to Great Universal Stores (GUS) – owner of Argos. A few months ago, Jungle appeared to be heading for the stock market – with a valuation of anything up to £750 million. But the downturn in hi-tech stocks meant that Jungle was sold for a pitiful £37 million. This figure is just half its annual sales.

Steve Bennett, founder of Jungle, once had a paper fortune of £200 million. He eventually received £8 million from the sale, along with a four-year contract. Other retailers were thought to have been in the frame for taking over Jungle, including Kingfisher and Dixons. GUS paid £25 million for the service, and also paid off £12 million of its debt – including the £2 million spent on its Web site. The service has 370,000 registered users, although it posted losses before tax of £11.4 million.

ADSL REALLY IS HERE

➔But is it worth £39.99 per month?

After years of delay, BT's ADSL service has launched in some parts of the country. But at £39.99 per month, it's not clear how many users will be prepared to pay for it. ISPs are now announcing their own services. For example, PC World has begun offering in-store demonstrations of the FreeservePlus ADSL service. This is aimed at consumers and small business users.

↑**BT's much-criticised Web site has also been relaunched.**

Analysts are warning users to be prepared for disappointment. Although 500 Kbit/sec download and 256 Kbit/sec upload speeds are faster than existing technologies, users are at the mercy of slow links on the Internet. Some believe that ADSL will prove to be little faster in real world usage. How far users are from their exchange and the quality of their wiring will also have an impact on the service.

BT Home Highway (ISDN) users are now wondering when the price of their service will come down. Users on the Standard Plan are paying £27 per month with no call allowance and those on the Inclusive Plan are paying £35 per month with £10 worth of calls. Home Highway users pay call charges at the normal rates and Internet access at 128Kbit/sec requires two phone calls – therefore two minimum charges. BT has yet to decide whether to lower its ISDN pricing, only that it will run alongside ADSL for the foreseeable future.

NEW CANON PORTABLE PRINTER

Canon has launched the BJC-55, a portable A4 printer that it hopes will become a standard piece of kit for business travellers. Including the 100-page lithium ion battery pack, it weighs just 900g and claims speeds of 5.5 pages per minute in mono and 2ppm in colour.

USB and parallel versions will be available, with both models having fast infra-red connectivity, so files can be printed from notebooks without having to physically connect. It will cost around £316 (£269 ex VAT). More information is available from Canon on 0121 680 8062 or **www.canon.co.uk**.

LINUX NEWS

FREE COREL PHOTO-PAINT

Following a troubled period that culminated in its chief executive quitting, Corel has launched its CorelDRAW Graphics Suite for Linux. And one of the components is available for free download. The image-editing application Photo-Paint can be downloaded from **http://linux.corel.com/products/pp9/download.htm**. But potential users should be prepared for a long wait – the three components amount to around 360MB. The full boxed suite can also be ordered from Corel's site – or from other Linux vendors.

LINUX TAKES OVER FROM UNIX?

With the purchase of the Santa Cruz Operation (SCO) by Caldera, the UNIX market could be heading into terminal decline. Known for in-fighting, high prices and a reluctance to standardise, the UNIX market has been eyed by Microsoft for years. But the open source nature of Linux means it's more likely to steal the UNIX crown. Caldera's only problem now seems to be which of its operating systems will be supported in the future.

LINUX GIVEAWAY

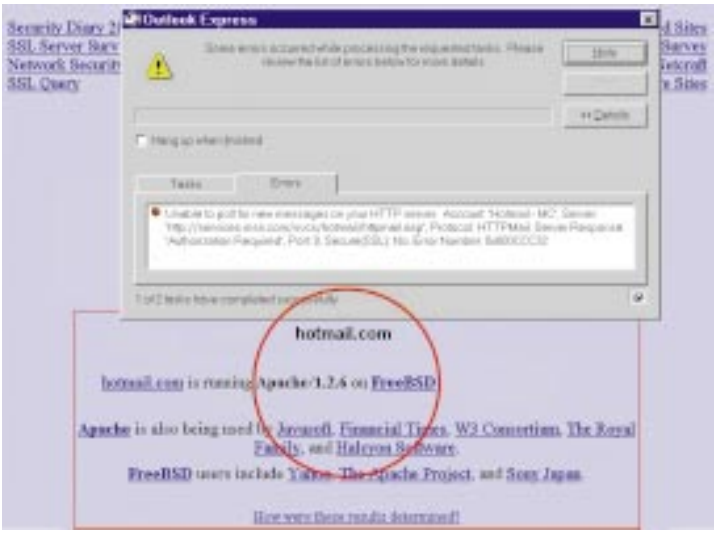
Most of us have a stash of trial Internet CD-ROMs. And it turns out that many Linux users are also equipped with multiple discs for their favourite os. The US-based service at freelinuxcd.org aims to help expand the Linux user base by distributing these spare discs. Although the service is only designed for US users, it points others to the 'Free Unix Give-away List' at **visar.csustan.edu/giveaway.html**.

NEW LINUX SUPPORT

Many users are not taking the Linux plunge because of the fear of things going wrong – and support being more difficult to obtain than that for Windows. But a new support service at **www.fixmylinux.com** might just make them have a change of heart. The service was in beta at the time of writing, offering areas for news headlines, discussions, instructions, updates and a search function.

ODSL LINUX LAB

In another move that could increase the number of businesses committed to Linux, IBM, Hewlett-Packard, Intel and NEC have decided to fund a non profit-making service to speed up the development of Linux business applications. The Open Source Development Lab (OSDL) is expected to open later this year and developers will be able to test applications on top-of-the-range equipment. Other companies are supporting OSDL, including Dell.



Hotmail was running on Unix!

➔But problems arise in move to Windows 2000

In something of an embarrassment for Microsoft, users of the Bath-based Web site **www.netcraft.co.uk** found the company's Hotmail service was running on Unix. It turns out that Hotmail has been running on FreeBSD with the Apache Web server since Microsoft took over the service two years ago. The company has now remedied this and Hotmail has moved over to Windows 2000.

Unfortunately, the changeover seemed to affect Outlook Express users who access Hotmail accounts from their desktop. Newsgroup postings revealed that some users could no longer access their messages in this way. Up until the move to Windows 2000, Outlook Express did not insist on cookies being used during the authentication process. Users enabling cookies found that some of their functionality was restored, but the service was still far more erratic than normal.

Two other Hotmail problems have come to light, although these are not thought to be related to the move to Windows 2000. Some users have found that by opening an account that was previously owned by another user, the original owner can be impersonated on the MSN Messenger service. And a new security flaw allows a Hotmail account to be accessed by anyone employing a special URL. Microsoft was busily fixing its servers at the time of writing, although the problem is thought to have been around since June.

PHONES AND PDAS COME UNDER THREAT

As the doom mongers predicted, non-PC devices are starting to be affected by data arriving from the Internet. At the end of August, some Nokia mobile phones froze after receiving a particular text message. Although this was put down to a bug, it shows what can be done. Users with the problem had to reset their phones by removing the battery.

And malicious code has been targeted at Palm hand-held devices. A program called Palm.Liberty.A appears to be a tool for obtaining illegal copies of the GameBoy emulator Liberty. When run, a trojan is able to delete data and applications from the Palm devices. But all the major anti-virus utilities can now spot this code – hopefully before it's synchronised into the Palm environment. The coding originated from Sweden – and is thought to have been written by one of Liberty's authors. Although no users are thought to have been affected, it is a good example of how vulnerable many portable devices are.

←Free music downloads – coming under threat.

MP3.com loses case against Universal Music

➔New legal cases may follow

Real world rules on copyright and music are generally well understood. So how is it that there are so many grey areas when it comes to the Internet?

It seems the legal world is now starting to catch up with the wired world. Music service MP3.com has been under intense pressure for some time now. It managed to settle out of court with several large music companies, after they accused the service of promoting piracy. Basically, MP3 files could be downloaded as long as the user could prove they had the original CD. This seemed to ignore the fact that anyone could borrow a CD from their mate down the road.

But Universal Music decided to take its case all the way to court, and it won around $118 million in damages – $25,000 per album stored at MP3.com. US District Judge Jed Rakoff wanted to send a clear message to other services potentially breaching copyright. Other actions are now expected as only around half of the CDs on MP3.com are thought to be covered under this agreement.

Meanwhile, Napster's trial was expected to get underway during the week commencing 2 October. The service came close to closure in July, but won an eleventh hour reprieve – which was followed by record use of the service. Get your MP3 files while you still can.

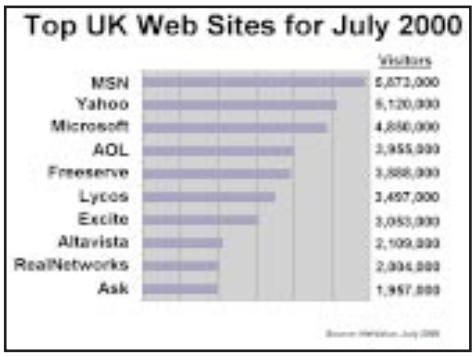
Top 10 UK Web sites dominated by US services

➔But half of the French and German places go to local services

NetValue is the first panel-based service that measures all Internet activity – from Web, e-mail and FTP to chat, audio, video, games and ICQ. In its study for July, the service found the top 10 UK Web properties (coherent sets of pages/domains owned by the same company) to be dominated by the big Internet names.

MSN was top with more than 5.8 million visitors. This was followed by Yahoo! with 5.1 million and Microsoft's own site with 4.8 million. Freeserve is the only non-US service to be in the UK top 10, with 3.8 million visitors.

This compares with only five of the French and German top 10 entries being US-based. The Government may want the UK to be the premier environment for e-commerce, but it seems it may already be too late. This month was also the first time that RealNetworks had been in the UK top 10 since March with over 2 million visitors at its site. This was put down to the huge success of Channel 4's **Big Brother** programme.



↑**Freeserve is the only local player in the UK Top 10.**

INTERNET NEWS

BT COULD SUE OVER HYPERLINK CLAIM

The news of BT's apparent ownership of the US rights to hyperlinks was greeted with disbelief by users and ISPs alike. But with 3G licenses pushing its debt up to around £30 billion, the company is now looking to capitalise on its patent – which is due to expire in 2006. But US ISPs have not been rushing to pay BT for their users' Web links. BT has warned that it will use legal action if necessary. And the matter may have to come to court, going by the country's reputation for litigation. Some analysts have laughed off BT's claim, suggesting that hyperlinks were in use long before the patent was granted in 1989.

MICROSOFT/VODAFONE INTERNET SERVICE

Microsoft and Vodafone are going to be working together to provide Internet services for business customers. The service is expected to start in 2001 and will offer Web pages, e-mail, calendar information and other data. Using technologies such as HTML, XML, WAP and GPRS, it will be available on various devices that have been enabled for Internet access.

BANKS AT CENTRE OF ONLINE FEARS

Online security fears are now centring on banks, following numerous high profile problems. And the BBC's *Newsnight* added to users' concerns after it showed how a hacker could watch a user keying in their banking credentials, after they had opened a trojan that had previously been e-mailed. Another concern is the way that many of the well-known viruses are being re-engineered. One variant of the Love Bug looks for account passwords at the United Bank of Switzerland. It arrives as an e-mail that seems to be a job advertisement, along with an attachment called Resume.txt.vbs.

INTEL THINKS PEER-TO-PEER

Napster may have given the music industry something else to worry about in the piracy stakes, but it's also given Intel an idea on the likely future importance of peer-to-peer connectivity for online PC users. It has got together with Hewlett-Packard and IBM to form a working group to plan new technology for this field. Intel believes that users should be working without relying on remote servers – and passing tasks to under-utilised processors elsewhere in their organisation.

NOVEMBER-FEBRUARY 2001

UPCOMING EVENTS

➔Get yourself to this month's computing and IT events

DATE 1-2 November
EVENT Softworld Sales, Marketing and Customer Management
VENUE Hall 18, NEC Birmingham
CONTACT www.softworld.co.uk

DATE 1-3 November
EVENT Compsec 2000
VENUE Elsevier Advanced Technology, Westminster
CONTACT www.elsevier.nl/locate/compsec2000

DATE 7-9 November
EVENT CIM 2000
VENUE NEC Birmingham
CONTACT www.cimshow.co.uk

DATE 7-9 November
EVENT E-Business Expo
VENUE Grand Hall, Olympia
CONTACT www.ebizexpo.com

DATE 7-9 November
EVENT Mobile Business Solutions
VENUE Grand Hall, Olympia
CONTACT www.mbusiness.co.uk

DATE 22-23 November
EVENT Internet World Manchester 2000
VENUE G-Mex, Manchester
CONTACT www.internetworld.co.uk

DATE 3-6 December
EVENT GI2000 (E-technology/business management conference)
VENUE EICC, Edinburgh
CONTACT www.global-informatics.com

DATE 5-6 December
EVENT Interactive TV and Online Learning
VENUE Cafe Royal, London
CONTACT www.access-conf.com

DATE 10-11 January
EVENT Comms for Business 2001
VENUE NEC Birmingham
CONTACT www.comms-dealer.com

DATE 6-8 February
EVENT ISPCON Europe 2001
VENUE Olympia 2, London
CONTACT www.ispconeurope.com

DATE 6-8 February
EVENT M-Commerce World
VENUE Olympia 2, London
CONTACT www.mcommercesource.com

DATE 23-25 February
EVENT SoHo Show London
VENUE Grand Hall Olympia, London
CONTACT www.portfolio.uk.com

Readers are advised to pre-register and check with organisers

C++ Workshop

The hidden power of Action Lists

Reduce the complexity of applications with Action Lists. Dave Jewell shows you how

This month, we're going to focus on Action Lists, a non-visual component that you'll find on the Standard page of C++ Builder's component palette. Borland expected all the 'Standard' components to be extensively used, but the Action List component has been sadly neglected by many programmers. This isn't too surprising, because it's not immediately obvious what the thing does! In this **MasterClass**, I'll try to dispel the mystery surrounding Action Lists and show what a useful friend they can be.

Getting acquainted with Action Lists

It would be easy to get bogged down trying to explain what an Action List does, so let's begin with a simple tutorial which will demonstrate the power of action lists, and all without you having to write a single line of code! (Note: I'm indebted to 'kodekraft', denizen of the CIX Delphi conference for giving me the inspiration behind this).

Begin by dropping an Action List component onto a blank form in a new project. Now double click the component and you should see a small window appear entitled Editing Form1->ActionList1. This is a special property editor that's used to configure action lists. On the left hand side of this window, you'll see a toolbar button that's used to add a new action to the list. Don't click the button itself, but click the small down-pointing arrow beside it. Got a popup menu? Great – let's carry on.

PCPlus SUPER DISC **PATH: \prog\files\cpp**

Dave Jewell
djewell@pcpmag.co.uk

PCPlus

NEXT MONTH

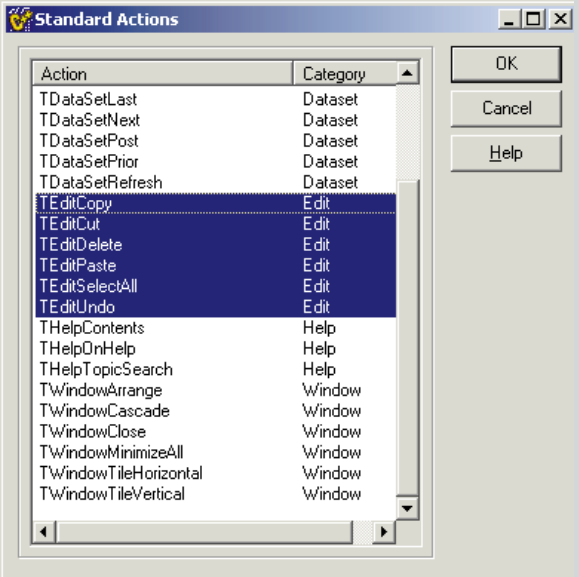
Make debugging your C++ Builder applications fun, thanks to the various debugging facilities built into the IDE

Creating actions

There are two types of Action for an Action List

Standard actions

You should now see a popup menu containing two items, New Action and New Standard Action. Select the latter item and you should be rewarded with a dialog similar to the one here:



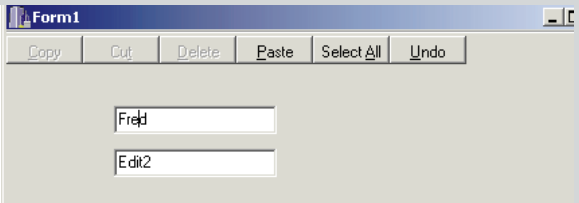
↑The Standard Action dialog allows you to choose from the list of standard actions, deciding what you want to add to your action list. You can use Shift-click to select multiple action items.

By the way, don't panic if what you see isn't identical to the dialog shown. Depending on what third-party components you've got installed, you may see extra stuff that we don't need to concern ourselves with here. As you scroll through the list of actions, you'll see that some of them are associated with the Edit category. Use Shift-Click to select all the Edit actions (just like the screenshot) and then click OK.

Note: The number of Edit actions you see will depend on what version of C++ Builder you're using. There are three in C++ Builder 4.0, but six in the latest C++ Builder 5.0.

You've now created an action list containing a set of standard edit actions. Back in the previous property editor window, select the Edit category in the left hand pane and you'll then be able to see them all. Now, go to the Win32 page of the component palette and drop a toolbar onto your form. Right-click the toolbar, select New Button to add a button to the toolbar and repeat this until you've added three buttons altogether – or six if using C++ Builder 5.0.

Next, select each of the toolbar buttons in turn and edit its Action property to link it with one of the actions; you'll see that the various actions appear in a drop-down list. Make sure that each toolbar button is linked to a different action. Now for the first big surprise: select the toolbar (not one of the buttons) and set its ShowCaptions property to True. Suddenly those toolbar buttons are displaying a set of captions corresponding to the edit actions, with caption names such as Copy, Cut, Paste, and so on. At the same time, the toolbar buttons have resized themselves to accommodate



↑Using Action items, you can arrange for Cut, Copy and Paste buttons to automatically be enabled/disabled in response to edit control changes, and to do the right when clicked. (Delete, Select All and Undo are only available if you're using C++ Builder 5.0)

each caption! But it gets even better: drop a couple of ordinary edit boxes onto the form, run the application and try playing around with those edit boxes.

See what's happening? Without writing any code, the toolbar buttons are automatically 'doing the right thing' according to the state of the edit controls. Thus, the Copy and Cut buttons are automatically enabled if there's a text selection and disabled otherwise, whereas the Paste button is enabled if there's a chunk of text on the clipboard. If you've got the other three buttons, you'll see that the Undo button is enabled if the currently focused edit box can undo a previous operation and the Select All button selects all the text in the current edit control. In a nutshell, clicking any of the toolbar buttons will do exactly what it says on the tin. This is all deeply cool stuff when you consider the amount of code that would be needed to make things work if you weren't using action lists.

By now, you're maybe thinking that with action lists you need never write any code again! Well, they're not quite that powerful(!), but they often greatly reduce the amount of code you need to write, and that's what RAD is all about as I've said in the past.

Automagical menus too...

From the above, you might think that action lists are only applicable to toolbar components, but they're actually much more general purpose than that. If you look at the TToolButton, TSpeedButton, TButton, TCheckBox, TRadioButton and TMenuItem components, you'll see that they've all got an Action property which can be pointed at an action. These components simply publish their Action property so it's available at design time but, in fact, all C++ Builder components have an Action property. (If you can't see it at design time, it simply means that you've got to set it up at run time.)

So let's suppose your application offers several different ways of performing an action. You might have a toolbar button which (for example) zooms in on a bitmap, and another which zooms out. Typically, your application will also have these functions implemented as two menu items. As a seasoned C++ **Masterclass** reader, you'll know that it's possible to implement a single event handler which responds to clicks on the menu item and on the toolbar button. But what if you want to change the hint string used by both controls, or what if you want to change the glyph that's used by the button and the menu item? Having to repeat every change twice is tedious and error prone. Action lists give us a better way.

The essence of action lists is that they enable user actions to be centralised. If you point more than one user interface element (be it a button, menu item, or whatever) at a single action, you can control the displayed glyphs, captions, enable/disable state, and so on, from that one point. If you decide to work with action lists in this way (and you should) then use the Execute method of the action item to control what happens when a button is clicked, menu item selected, or whatever.

A simple action list demo

Let's wrap things up by giving you a little demonstration of how you'd use action lists in an actual program. On this month's **SuperDisc**, you'll find the source and executable for a simple application called ActionDemo. You can see it running below.

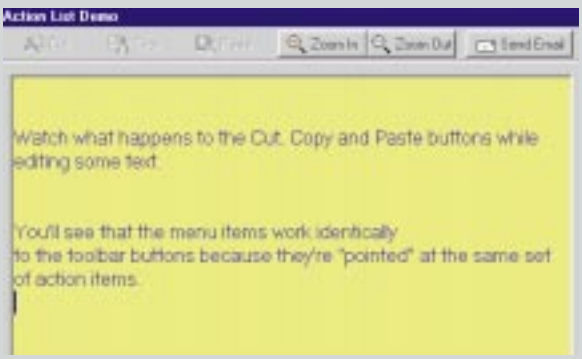
This demo application has three menus, View, Edit and Email which provide a route to the same functionality accessed via the various buttons on the toolbar. We've already covered the way in which the standard Edit actions work. For the purposes of this demonstration, I've also added a couple of non-standard actions to implement 'zoom in' and 'zoom out' and a third action to implement email sending.

None of this functionality is really there, of course – this is just a demo of how to use action lists. You'll see that for the three non-standard actions, I've implemented three Execute handlers which simply put up a dialog to confirm that you've pressed the button or selected the menu item. In a real world program, you'd replace this with the actual code that sends an email, or whatever.

Tip: When implementing non-standard actions such as the zoom in action shown here, do bear in mind that the button or menu item will be disabled until you supply an Execute event handler.

This is because C++ Builder doesn't know how to handle the action unless you give it an event handler, so it disables the control until you've done your bit! Similarly, you should be careful not to provide an Execute handler for standard actions. If you do, it'll replace the 'canned' functionality and your cut, copy and paste buttons will suddenly stop cutting, copying and pasting!

Well, that's it for this month; this **Masterclass** has been slightly unusual in that I've provided no code. And that's exactly the point about action lists – much of the time you don't need any! Hopefully, by now you've had a 'Eureka!' experience and you're keen to revisit some of your old C++ Builder apps, tidying them up with action lists. Have fun!



←Here's a little Action list demo program, the source code and executables for which you'll find on this month's cover disk. It demonstrates the use of both standard actions and custom actions within the same application.

FORUM www.pcplus.co.uk/forums/cpp

Additional Action Lists... And how to make useof them

What are all those Actions?

In this **MasterClass**, we've looked at only one aspect of action lists, the various predefined actions in the Edit category. But as you saw earlier, there are a number of other categories as well. If you're using C++ Builder 4.0 Professional (included on the Issue 166 cover disk) then you'll have noticed that you've also got a Windows category and a Dataset category. If you've treated yourself to the new C++ Builder 5.0 development system, then you'll see that there's also a Help category. What are all these other actions, and how can you make use of them?

As the name suggests, the Dataset category is for use inside database applications. Just as the Edit category gives you a series of 'potted actions' for performing cut, copy, paste, and so on, the Dataset actions allow you to set the current record to the first or last record in the dataset, move to the next or previous record, delete the current record, and so on.

The Windows actions are only likely to be useful if you're building an MDI-style application since they all relate to MDI window operations. Thus, you've got actions for cascading all the child windows, tiling them all vertically or horizontally, minimising everything, etc. Finally, the Help category (only available in C++ Builder 5) can be used to invoke help on a specific topic, display a help file's 'contents' page or even invoke the standard Microsoft 'help on help' information. Used carefully, action lists can greatly simplify the code of a complex

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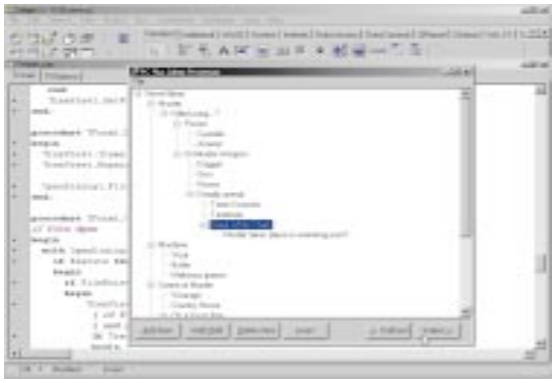
Delphi Workshop

How to master the TreeView control

Huw Collingbourne starts work on a drag-and-drop Ideas Processor application



→ The TTreeView control makes fairly light work of programming a collapsible outliner such as this one.

Once upon a time, in the far off days when DOS was the PC's dominant operating system, there existed some useful applications called Ideas Processors. These were tools that encouraged an activity called 'brainstorming'. The theory was that creative people (like you and me!) have more ideas than they know what to do with. For example, a software developer might have all kinds of unrelated programming ideas but no clear plan of how to put them together. A thriller-writer might know how and when the murder is committed but can't seem to figure out who did it and why.

The Ideas Processor comes to the rescue. To get over a mental block, the programmer or novelist can jot down ideas in random order. Subsequently, these ideas can be arranged into logical groups beneath categorised headings where new ideas may be added and old ideas deleted. In addition, existing ideas can be moved around in the hierarchy of headings in attempt to discover new relationships between them.

PCPlus SUPER DISC **PATH:** \prog\files\delphi

These days, most decent word processors incorporate the principal features of an ideas processor in the form of a collapsible outliner. But, while word processing outliners provide the essential features of a brainstorming tool, they tend to emphasise the organisational strengths of outlining at the expense of its creative possibilities. This month, I plan to go back to the essence of outlining and start work on a standalone utility that puts the brain back into brainstorming. **PCP**

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NEXT MONTH

Huw expands his coverage of Delphi components

→ Tree of knowledge

It's been several years since I dealt with TreeViews in any depth, so I'll look at its essential features

Fortunately, Windows provides a collapsible outliner as standard. It is the TreeView control. Delphi's version of this is called TTreeView and is found on the Win32 toolbar. TTreeView is a complex component. This month we'll look at TreeViews and its essential features and end up by programming a drag-and-drop enabled collapsible outliner. Let's take a first look at the TreeView. First start a new project and drop a TTreeView component onto it. If you want to populate the TreeView, double-click it and add a few new items or sub items in the TreeView Items editor. Then run the project to see how the sub-items can be collapsed and expanded by clicking them.

Now try out the TreeView in my finished outliner. Load and run the project tv.dpr. I've already saved a sample outline to disk. Use the file menu to open the file named ideas.otl. Here you'll find that I've jotted down some ideas for my latest novel – a murder mystery.

Initially, the outline is fully expanded. You can collapse its branches by clicking the '-' symbols. For example, click the '-' alongside the heading 'Murder' to hide all its sub-branches. The '-' now turns to a '+' to show that there are some hidden branches beneath this heading. Click the '+' to expand the branches.

You can also add new branches. With the heading, Novel Ideas selected, click Add Item. A branch labelled NewItem appears at the bottom of the tree. Edit the text to Detective. Make sure this branch is still selected. Now click Add Child. This time a New Item appears as a sub-branch beneath the Detective Heading. Edit it to Miss Marple. Maybe you don't want the Detective heading after all. Highlight it and click Delete Item. Click Yes when prompted. The Detective heading and all its sub-headings are erased in a single operation.

You can also rearrange existing items. Make sure the Murder heading is expended. Now select the Great White Shark heading. Click Outdent. This moves the heading one step to the left. Click Indent. It moves it to the right again. Make sure the Great White Shark heading is expanded. Beneath it, I've entered the note Murder takes place in swimming pool?. This idea occurred to me when I thought of the shark. But now it seems to be at the wrong place in the hierarchy. It should be beneath the heading Scene of murder. No problem, I can move it there. Highlight the text Murder takes place in swimming pool? and then, keeping the left-mouse button pressed, use the mouse to drag and drop the text onto the heading Scene of Murder. The text is now moved beneath this heading.

Nodes to freedom

Now turn to the editor to see how all this has been implemented. First, look at the code responsible for loading the saved data from disk. You'll find this in the TForm1.Open1Click procedure:

```
TreeView1.LoadFromFile(FileName);
If TreeView1.Items.Count > 0 then
begin
  TreeView1.FullExpand;
  TreeView1.Items.GetFirstNode.Selected := true;
end;
```

In common with many other Delphi components, TTreeView comes with its own ready-to-run file loading routine, LoadFromFile(). Data is saved in the form of tabbed text. You can verify this by loading the data file, ideas.otl, into Notepad. Each tab represents one level of indent in the TreeView hierarchy.

To determine the number of items in the TreeView, I've used the Count method of its Items (TTreeNodes) property. When there are more than 0 items, I've used the FullExpand method of the TreeView itself to display all the nodes. Finally, to place the highlight over the first node, I've used the GetFirstNode method of Items to access the first node, then I've used the Selected method of this node (a TTreeNode object) to highlight it. By now, you are probably beginning to realise just how confusing a TTreeView object can be!

Use the listing in the box, Tree View Objects to help you understand the remainder of the code in this unit. For instance, consider the code of the AddBtnClick method:

```
procedure TForm1.AddBtnClick(Sender: TObject);
var
  Node : TTreeNode;
begin
  Node := TreeView1.Items.Add(TreeView1.Selected,
  'NewItem');
  Node.Selected := true;
  Node.EditText;
end;
```

This method adds a new heading to the tree at the same level as the selected heading. This time, I have declared a TTreeNode variable called Node. The first line of the method adds a new TTreeNode to the Items property of TreeView1. The Add method takes a string as its second parameter – the text of the node – and an existing TTreeNode as its first parameter. The new node will be added beneath this existing node. Finally, the node we've just added is assigned to the TTreeNode variable, Node. In the second line, the highlight or selection is moved to the new node. Finally the EditText method makes the text of the new node editable so that the user can easily rename it.

The other buttons use various other methods to add a node as a child (at an indented level) of an existing node, to insert a node immediately above the selected node or to delete the currently selected node and all its children. By the way, there is an extra problem that has to be solved when deleting a node. Once the node has been deleted, the selection highlight is left with nowhere to go. I have therefore placed it explicitly upon its predecessor by subtracting 1 from the AbsoluteIndex property of the selected TTreeNode:

```
index := TreeView1.Selected.AbsoluteIndex - 1;
```

AbsoluteIndex is the index of a tree node relative to the first tree node in the tree. The index variable to which this value is assigned is later used to move the selection when the previously selected node has been deleted:

```
TreeView1.Items[index].Selected := true;
```

On the move

There are just two other buttons that need to be explained. The Indent and Outdent buttons are used to move the selected item one level inwards or outwards on the tree. Look at the code of TForm1.OutBtnClick. This first determines the index of the Parent node – that is, the node one level higher than the current one:

```
parentindex := Node.Parent.AbsoluteIndex;
```

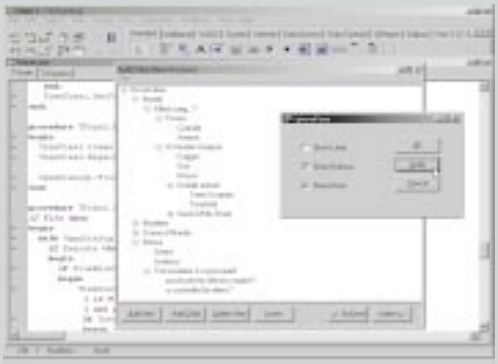
Then it uses the MoveTo method of the selected node to move it to the same level as its parent. The naAdd parameter here controls how the node is moved. This and other parameters are documented in TTreeNode.MoveTo in Delphi help:

```
TreeView1.Selected.MoveTo(TreeView1.Items.Item[pa
rentindex], naAdd);
```

The code attached to the Indent button is similar apart from the fact that it uses the TTreeNode GetPrevSibling and GetNextSibling methods to indent the selected item beneath the previous or next nodes at the same level as necessary.

Finally, I've added drag-and-drop functionality. This lets you select a node and move it to another position by dragging it with the mouse. I've explained drag-and-drop many times in this column so I won't spend much time on it now. The essential code can be located by selecting the TTreeView component and using the Events page of the Properties inspector to locate the event-handling code for OnDragDrop and OnDragOver.

So far, I've programmed a perfectly respectable collapsible outliner which can create, delete, indent and move headings and sub-headings. However, to transform this into an ideas processor, I'd like to be able to associate longer chunks of text with each heading. Moreover, I'd like to be able to edit this text in its own edit box, elsewhere on the form. In other words, when I select a heading such as 'Scene of Murder', I'd like to be able to enter free-form notes in an edit box rather than having to type them as subheadings on the tree.



←Select Options from the File menu to alter the appearance of the outline using this dialog box.

↑The Borland Example2.dpr project provides a basic illustration of how to attach records to tree nodes.

When I subsequently reselect the 'Scene of Murder' heading, I'd like my notes to reappear in the edit box.

How can this be done? Well, one way would be to associate a different piece of text data – maybe in a record or an object – to each tree node. I came across an example of how this might be accomplished in the help system under TreeNode.Data. The BorlandExample.dpr project implements the code of this example. The BorlandExample2.dpr project elaborates upon the example by adding the ability to create child nodes. See if you can use these examples to develop my Ideas Processor further.

FORUM www.pcplus.co.uk/forums/delphi

Code Corner

Tree View objects

The principal properties and methods

TreeViews are complex objects. They are composed from a list of tree-nodes – the individual branches of the tree. In Delphi, the TreeView component is an instance of the TTreeView class and each node is an instance of the TTreeNode class. A TreeView's list of TTreeNode objects is maintained by its Items property. This property is itself an instance of the TTreeNodes class.

Pay attention here. The TreeView's Items property is a TTreeNodes object (in the plural) whereas the individual nodes which it maintains are TTreeNode objects (in the singular). In spite of the confusingly similar names, a TTreeNodes object is completely different from a TTreeNode object. When referring to the Delphi help system, you need to be very careful that you are not looking up the wrong object.

To work efficiently with a TreeView you will need to use all three object types. To help cut through the confusion, here is a quick reference to the principal properties and methods used in this month's project.

TTreeView

```
procedure FullExpand;
property Images: TImageList;
property Items: TTreeNodes;
property Selected: TTreeNode;
```

TTreeNodes

```
function Add(Node: TTreeNode; const S: string): TTreeNode;
function AddChild(Node: TTreeNode; const S: string): TTreeNode;
function Delete(Node: TTreeNode);
function Insert(Node: TTreeNode; const S: string): TTreeNode;
function GetFirstNode: TTreeNode;
property Count: Integer;
property Item[Index: Integer]: TTreeNode;
```

TTreeNode

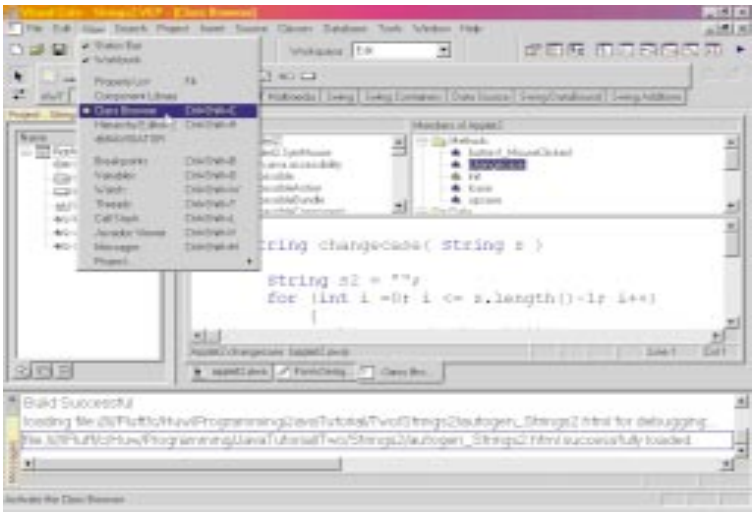
```
function EditText: Boolean;
function GetNextSibling: TTreeNode;
function GetPrevSibling: TTreeNode;
procedure Collapse(Recurse: Boolean);
procedure Expand(Recurse: Boolean);
procedure MoveTo(Destination: TTreeNode; Mode: TNodeAttachMode);
property AbsoluteIndex: Integer;
property HasChildren: Boolean;
property Level: Integer;
property Parent: TTreeNode;
property Selected: Boolean;
property SelectedIndex: Integer;
```

Java Workshop: PART TWO

Looping the loop

PCPlus SEE YOUR SUPER DISC

Huw Collingbourne fine hones some programming techniques by unravelling Strings



↑This month's final project shows how to change the case of a string by using a number of important programming techniques.

Last month we got to grips with the fundamentals of programming in Java. We learnt how to respond to events such as mouse clicks, how to create variables and use built-in methods. While you can accomplish a great deal using ready-to-run methods such as getText(), you can do far more by creating methods of your own. This month we shall learn how to create methods that can modify data items that we pass to them.

On the case

To get the ball rolling, let's begin with a simple program that can change the case of a String entered by the user. We're going to use Visual Café (on this month's **SuperDisc**) to cover these steps. Start a new project in a Visual Café (File | New Project). In the dialog box, select AWT Applet and click OK. Now, from the AWT page of the palette, select one each of the following three items and drop them on to the blank form:

PCPlus SUPER DISC **PATH: \prog\files\java**

TextField
TextArea
Button

Now save the project, and we're ready to go! PCP

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NEXT MONTH

Next month we'll be taking a look at that mysterious Character we saw earlier and finding out how to add a touch of class to your code by creating new objects

Techniques

How to create your own methods in Visual Café that can modify data items

Resize the TextField and TextAreas so that they are wide enough to contain a line of text. Double-click the Button and, in the Event Binding dialog, double-click mouseClicked. In the code editor you should now see this empty method:

```
void
button1_MouseClicked(java.awt.event.MouseEvent
event)
  {
    // to do: code goes here.

  }
```

Edit this method by adding the lines of code between the curly brackets as shown below:

```
void
button1_MouseClicked(java.awt.event.MouseEvent
event)
  {
  String s;
    s = textField1.getText();
    s = s.toUpperCase();
    textArea1.setText(s);

  }
```

Make sure that you have entered the code exactly as it appears above. Then run the program (press [CTRL][F5]). If you receive any error messages, check your code. Ensure that each line ends with a semi-colon and that all the variable and method names are entered in the correct case – remember, Java considers an upper case S to be different from a lower case s. Fix any errors and recompile.

Once it's running enter Hello World into the Textbox and click the Button. This should cause HELLO WORLD to be displayed in the TextArea. The variable s is an object that has been created from the String class and so it has access to the String class' toUpperCase() method. We can call the method in this way:

```
s.toUpperCase();
```

This returns the upper case version of the string s. However, it does not change the value of the variable s. To do that we must specifically assign the upper case value that has been returned to the variable s:

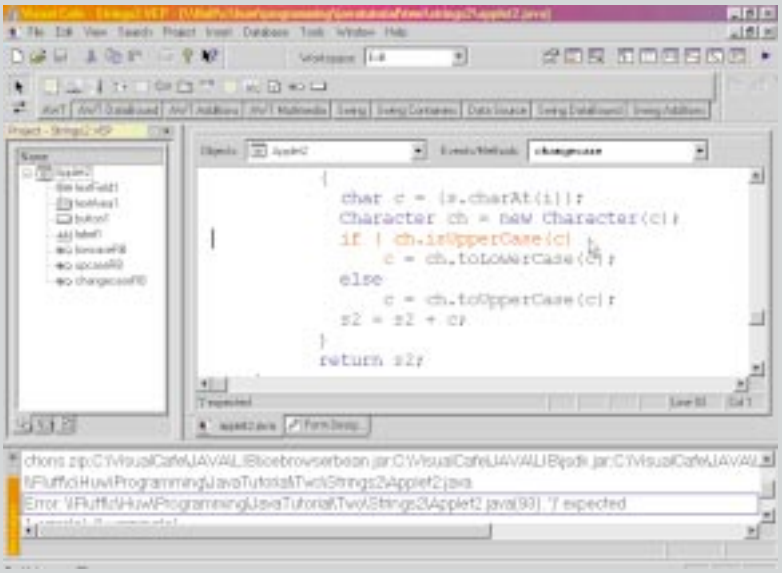
```
s = s.toUpperCase();
```

You need to know how a program can be made to choose one of several possible actions. This is a fundamental programming technique which lets the same program do different things at different times.

Decisions, decisions...

Create a new project as an AWT applet. Drop a TextField and a Button onto the form. Double-click the Button and set up a mouseClicked event handler. Edit he code of this method to the following:

```
void
button1_MouseClicked(java.awt.event.MouseEvent
event)
  {
    int x = 1;
    if (x == 1)
    textField1.setText("One");
    else if (x == 2)
```



↑In Java, the test in an 'if' condition must be enclosed between round brackets. If you forget a bracket, the compiler will complain.

```
    textField1.setText("Two");
    else
  textField1.setText("Another number");

  }
```

Run it and click the button. Next close the program and change the value of x to 2 in the code:

```
int x = 1;
```

Try the program again. Then change the value of x to 0 or to 3 and try it again. As you see, the code executes a different statement depending on the value of x. Note, by the way that in Java as in C++, when you test the value of a number you must use double equals-signs (==) but when you assign a value to a variable, you use single (=).

Of course, it would be more useful if the program could decide on different courses of action in response to use input. To see how that can be done, load up the Strings.vep project. Run the program and try it out.. Then turn to the source code of Applet1.java and find the button1_MouseClicked() method. This code finds out which of the three radio-buttons or 'checkboxes' on the form has been selected.

Visual Café automatically groups multiple checkboxes into an object called Group1. This makes it easy to find the currently selected item using the getSelectedCheckbox() method and test if it is equal to a named checkbox such as lowcaseRB.

If the first test evaluates to True, then the line following it is executed while the next test, following the keyword 'else', is bypassed. If, on the other hand, the first test evaluates to False (that is, the lowcaseRB checkbox is not selected), then the code following else is executed. In this case, the code happens to be another if condition which tests if the upcaseRB is selected. If this evaluates to True, the next line is executed, otherwise the code following the next else executes.

The code following the final else is quite complex and extends over several lines. In order to ensure that all this code executes if the preceding if tests fails, I have had to enclose the code between curly brackets. Remember that the { and } characters are Java block-delimiters. When the program enters a block beginning with { it will carry on trying to execute all the code it encounter until it finds the terminating }. Block delimiters can be nested. So you will frequently write code like this:

```
{
  // some code
  {
  // more code
  }
}
```

This defines two code blocks, one inside the other. The outer code block is terminated by the final } character. You musty always keep the block delimiters balanced in your code. If you forget one, your program will not compile.

Let's assume that the changecaseRB check box is selected. This causes the two if tests to fail. As a result the code block following the final else is executed. This code changes the case of each character in the string. In order to do this it examines each character in turn and, if it is lowercase it changes it to uppercase and vice versa.

In order to move through each slot in an array of characters, I have used this 'for' loop control statement:

```
for (int i =0; i <= s.length()-1; i++)
```

A for loop runs a piece of code for a set number of times. Here it runs the block of code delimited by the pair of curly brackets following the loop control statement. The for loop control statement is in three parts. The first part initialises a variable. Here an integer (int) variable called i is assigned the value 0:

```
int i =0;
```

The next part contains a test. The for loop continues executing as long as the test remains true. In this loop, the test states that the loop should continue for as long as the value of i is less than or equal (<=) to the length of the String s minus 1 (minus 1 because the first character is at index 0, not at index 1):

```
i <= s.length()-1;
```

The last part of the loop increments the control variable. In Java, the ++ operator increments (adds 1 to) a value, so i++ adds 1 to i each time the loop executes.

We then create an object, ch, which is based on the Java class named Character. Code within an if..else statement then changes c to lowercase if it is currently uppercase or to uppercase if it is lowercase. Finally the char, c, is added to the String s2.

Picking arguments

The real problem with the code of the button1_MouseClicked() method is that it's too long. A long method can be difficult to understand. Load up Strings2.vep. Here we have parcelled out bits of code into their own methods. In particular the long block of case-changing code is now contained within the method beginning:

```
String changecase( String s )
```

This method header starts by declaring the type of data it will return when it has finished executing – here a String. A method that returns no data begins with the word void. Next comes the name of the method, changecase, and a pair of round brackets. Between the brackets, a String argument s, is declared. An 'argument' is a kind of variable that can be passed from one method to another.

Notice the final line in the method:

```
return s2;
```

This means that the method returns the value of s2 to the piece of code that called the method. This is how button1_MouseClicked() calls the changecase() method and passes to it the String s:

```
textArea1.setText("change case = " +
 changecase(s));
```

The changecase() method returns the value of the case-altered string and it is this returned string which is now displayed in textArea1.

FORUM **www.pcplus.co.uk/forums/java**

Using IE components: PART TWO

Visual Basic Workshop

PCPlus SEE YOUR SUPER DISC

Dermot Hogan makes a simple HTML editor and browser using a DHTML control

This month, I'll look at using a browser component in a Visual Basic application. I'll use a DHTMLEdit control to make a simple HTML editor and browser. While this isn't going to be comparable with commercially available products, it might be a little more 'visual' than a Notepad-based HTML editor.

Instead of using a plain menu driven command system for making some text bold or italic, I decided to investigate one or two of the less well publicised controls and, in particular, set up a Toolbar control to make formatting easier to use.

A Toolbar is a control 'container', it acts as an environment for other controls. For a Toolbar, you're restricted to buttons or images which can be clicked. These are normally added at design time by a pop-up property page which enables you to specify extra buttons and 'button menus' – a menu attached to a button. However, it's all a bit primitive. For example, you can't move the Toolbar around or dock it. It just sits perched at the top of the form looking rather out of place. Also, the button sizes are not very flexible – the control seems to want to keep the buttons the same size.

There's another control called a Coolbar. This has resizable sections called bands – the icon tray at the bottom of your Win98 screen is a type of Coolbar. Unfortunately, in Visual Basic, you can only put one control in a Coolbar band – about as much use as a toy boat in a transatlantic yacht race. The recommended way to use a Coolbar is to put a PictureBox control as the single child control of a band and then to put other controls inside this PictureBox. I'll look at using this feature next month.

In order to use a Toolbar, you have to load it into the Toolbox. From the Project menu, select Components and check the item marked 'Microsoft Windows Common Controls 6.0'. You'll then see it appear on the Toolbox. Select the Toolbar control and draw it on a form – you'll see it position itself at the top, just under any menus you've got. It might not be where you want it, but that's where it goes. Right click on it to open up its property page, select the Buttons tab and add a few buttons. To start with, I've added four normal buttons and a menu button. The normal buttons will be used to format a selection in the DHTMLEdit control. Since this is basic HTML, you can only apply a limited formatting to any text. The formatting allowed is bold, italic, colour and underline. The button menu will be used to alter the HTML font size.

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Before I get into how text in the DHTML is formatted, there's a minor problem with selecting colours. This is conventionally done with a colour picker control. You select a colour from a palette and this is returned for use in your program. However, Web browsers typically use a restricted colour palette known as the 'safety palette' which only has 216 colours. Each colour in the safety palette has a name such as 'darkcyan'. But the colour picker that comes with Visual Basic was built in the dawn of time – way before any browser was invented.

With HTML, you can use 24-bit RGB values – it's just easier to use the names from the safety palette for most things. So, with the traditional Windows colour picker, you return an RGB value and set the HTML colours directly. It's not the most elegant way of going about setting HTML colours, but it works. PCP

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PCPlus NEXT MONTH
Next month, I'll be looking into Coolbars

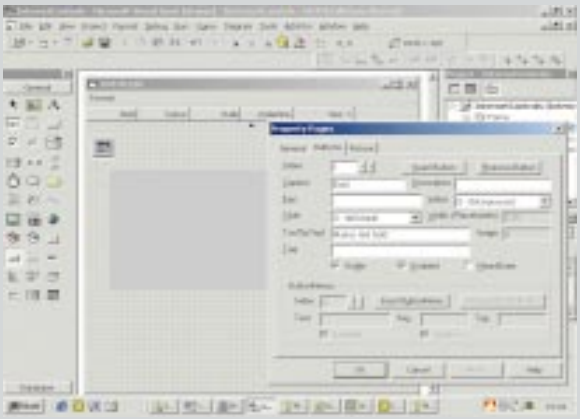
ExecCommand

The key to getting the DHTML editor to do anything is to use ExecCommand and QueryStatus methods

With ExecCommand and QueryStatus methods you can format text, build HTML tables, cut and paste, add links and generally programmatically manipulate the HTML in the control. Essentially, you check that the selection in the control is in a state to accept a command, for example, it's not very helpful to try to set the font size of a graphic and then execute the command:

```
If de.QueryStatus(DECMD_BOLD) = DECMDF_ENABLED
Then
  de.ExecCommand DECMD_BOLD
End If
```

In the code above, the DHTMLEdit control, de, is queried using QueryStatus to see if it's okay to bold the selection. If it is okay, an ExecCommand is issued, instructing the control to put the selection into a bold font. This is correct as far as it goes, but it turns out that the DECMD_BOLD command is a toggle: if you apply it twice, it un-bolds



↑ You set up a Toolbar by right-clicking on it to display the property pages. These let you define the number of buttons and to some extent the layout. It's not as flexible as you might wish, though.

the selection. Also if the selection is in a bold font already, the control doesn't think that it is in a state to be 'bolded' again. Instead, it returns DECMDF_LATCHED indicating that the selection is already in the state requested. To get round this, the test must look like:

```
c = de.QueryStatus(DECMD_BOLD)
If c = DECMDF_ENABLED Or DECMDF_LATCHED Then
```

The buttons for italic and underline execute pretty much the same way.

The code for the toolbar is straightforward. Here's the code for the colour picker:

```
Private Sub Toolbar1_ButtonClick(ByVal Button As
MSComctlLib.Button)
Dim c As Long
Select Case Button
Case "Colour"
  cd1.ShowColor
  c = cd1.Color
  de.ExecCommand DECMD_SETFORECOLOR, , c
```

You can see that all you need to do is perform a Select Case on the Toolbar button's Caption. The code here just displays a colour pickers and retrieves the colour selected as an RGB value. This is then used, omitting any state checking, as the final argument for the ExecCommand method (I'll describe the second argument below).

The menu button coding is activated from a different place, ButtonMenuClick. This means that you can have an event for the Size button and also one for the two Increase and Decrease font buttons. The code for increasing or decreasing the font size just adjusts a HTML font size (a number from 1 to 7):

```
If de.QueryStatus(DECMD_SETFONTSIZE) =
DECMDF_ENABLED Then
  i = de.ExecCommand(DECMD_GETFONTSIZE)
  If i < 7 Then
  i = i + 1
  de.ExecCommand DECMD_SETFONTSIZE, , i
  End If
End If
```

You can undo commands easily: the DECMD_UNDO and DECMD_REDO undo or repeat an editing operation. But we can be a bit cleverer about showing whether there's anything to undo or redo. The QueryStatus command will reveal if there is anything at all to undo, we can use this to disable the appropriate button:

```
If de.QueryStatus(DECMD_UNDO) = DECMDF_ENABLED
Then
  de.ExecCommand DECMD_UNDO
Else
  Toolbar1.Buttons(6).Enabled = False
End If
```

How do we reset the Undo button when there's something to undo? This can be done using the DHTMLEdit control's DisplayChanged event:

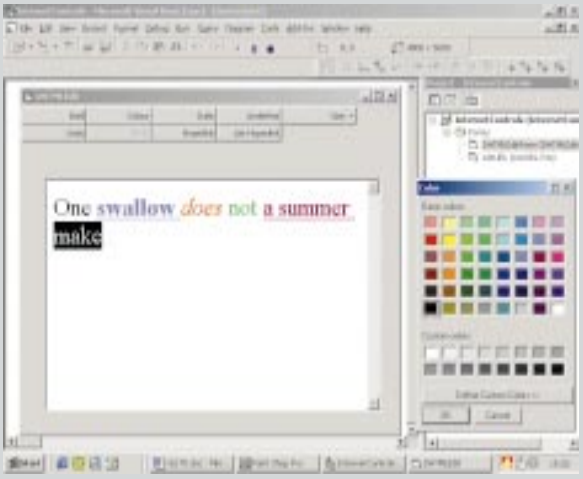
```
Private Sub de_DisplayChanged()
If de.QueryStatus(DECMD_UNDO) = DECMDF_ENABLED
Then
  Toolbar1.Buttons(6).Enabled = True
End If
If de.QueryStatus(DECMD_REDO) = DECMDF_ENABLED
Then
  Toolbar1.Buttons(7).Enabled = True
End If
End Sub
```

The DisplayChanged event is called whenever anything changes in the display – so it can be called an awful lot. It's best to keep any processing here simple and to the point. All that this section of code does is query the undo/redo status and enable the relevant button. In passing, it's also worth nothing that the DocumentComplete event can be used to trigger any processing that you want to do when a document has finished loading.

Last month, I used the Busy property of the control to test whether the HTML had been completely rendered. The DocumentComplete event is also fired when this asynchronous processing has finished.

Hyperlinks

You can add hyperlinks using the DECMD_HYPERLINK command. Unlike all of the other commands we've looked at so far, this command displays a dialog box, prompting you for a destination



↑ Here's the rather colourful result of editing HTML text using the DHTML Edit control. You can use the DECMD_FONT command for more complex formatting operations.

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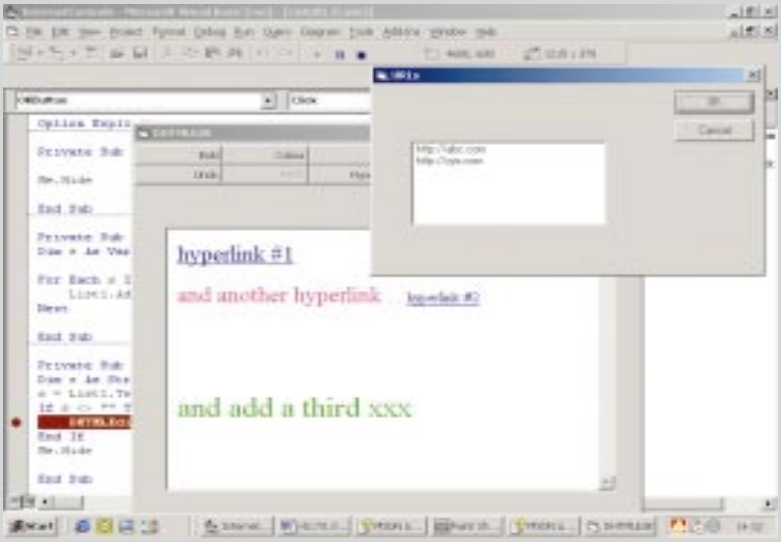


↑ This code uses the DOM to populate a list box with URLs already contained in the DHTML document. You can select one of these to create a new hyperlink reference.

URL. You can control this behaviour by using the second argument of the ExecCommand method. ExecCommand takes up to three arguments. The first is the Command ID as I've used above; the second argument is used to control the display of the dialog box: OLECMDEXECOPT_DODEFAULT performs the default operation (in this case to display the dialog box), OLECMDEXECOPT_PROMPTUSER prompts the user and OLECMDEXECOPT_DONTPROMPTUSER does the opposite. If the dialog isn't displayed, you have to use the third argument to supply the required target URL.

This last feature is useful if you want to restrict the choice of URLs to those already existing in a document or project. Here's the code to extract a list of URLs from a DHTML document using the Domain Object Model or DOM:

```
Dim s As Variant
For Each s In DHTMLEditForm.de.DOM.links
  List1.AddItem s
Next
```

A list box is populated, then a selected URL extracted and used like:

```
DHTMLEditForm.de.ExecCommand DECMD_HYPERLINK,
OLECMDEXECOPT_DONTPROMPTUSER, List1.Text
```

The button List Hyperlink opens a dialog box, ListURL, which contains the code to populate and select a hyperlink. Because you can access the DOM from Visual Basic code, you can do a lot more than I've covered here, but the structure of the DOM and how it represents DHTML is an entirely different, and quite substantial, topic.

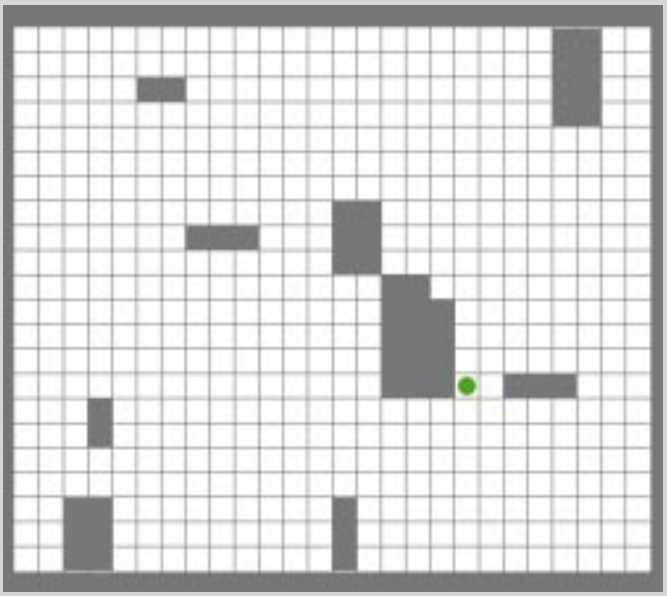
Command IDs

Here are some command codes used in the DHTMLEdit control. You can experiment with them to add more functions to the editor

COMMAND ID	FUNCTION
DECMD_COPY	Copies the selection to the Windows Clipboard.
DECMD_PASTE	Pastes the contents of the Windows Clipboard at the insertion point or over the selection.
DECMD_DELETE	Deletes the selection without placing it on the Windows Clipboard.
DECMD_SELECTALL	Selects everything in the body of the document.
DECMD_UNLINK	Removes ‹A› and ‹/A› tags from the selection.
DECMD_IMAGE	Inserts a graphic at the current insertion point.
DECMD_ORDERLIST	Turns the selection into a numbered (ordered) list or removes selected list items from a numbered list.
DECMD_UNORDERLIST	Turns the selection into a bulleted (unordered) list or removes selected list items from a bulleted list.
DECMD_FINDTEXT	Displays the Find dialog box to allow users to specify text to search for in the current document.
DECMD_FONT	Displays the Font dialog box and applies the user's choices to the selection.

WILF'S WORKSHOP

Robots are pretty unintelligent, especially when they don't have a memory to rely on. **Wilf Hey** examines automata



↑The green dot is a narrow-minded robot, with no memory and only reflex actions, but it can find its way around a landscape with obstacles in its way, and could be easily modified to solve many types of maze.

PCPlus SEE YOUR SUPER DISC

Decisions, Decisions, Decisions

This month's workshop looks to the subject of automata: objects (programs or machines) that can be turned on and left to do their task without much intervention. Machines that work unattended, especially if they move, are dubbed robots, coined last century from the Czech word for worker.

Essentially, an automaton can be pretty unintelligent. The approach of Artificial Intelligence researchers is to establish machines that are governed by their own thoughts. The development of robots has been a promised spin-off that fuels the search even when it looks hopeless a lot of the time, so you can think of the AI expert as a robot creator who hopes to improve his robots by incorporating features of the biological mind. But this is all a guise. The AI expert would love to see real intelligence created artificially: any robot is simply a demonstration of what he has accomplished so far.

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I have recently looked at neural nets, and in the past have investigated such useful procedures as minimax (for determining game strategies). But we can ignore these and go back to the simplest, least intelligent types of robot that can exist. The robot I am going to create this month has sensors so that it does not run into obstacles in its way. It doesn't have any on-line memory – and just enough of a program to tell it what to do in what various situations.

Let's consider this a little more closely: a human walking in a straight line who finds an obstruction can stop, think and turn in one of several directions. This automaton is so stupid that it cannot make a decision. It turns according to a small number of rules coded within its feeble memory. It is no more than a moving State Machine.

The program ROBOT1 (on the **SuperDisc**) is a DOS based program that shows us the world of this dumbest of dumb robots. It wanders over a field divided into squares, with several obstructions set at random on the field.

My job is to create this robot so that it behaves in a way that an onlooker might think is intelligent. It will walk in a straight line, and when it encounters an obstruction, it will walk around its perimeter. It has no memory, so once it starts going around the obstruction, it will continue doing it until it is shut down. This is because when it has completely circled the object, it is back to where it was and can only take the same action it did last time.

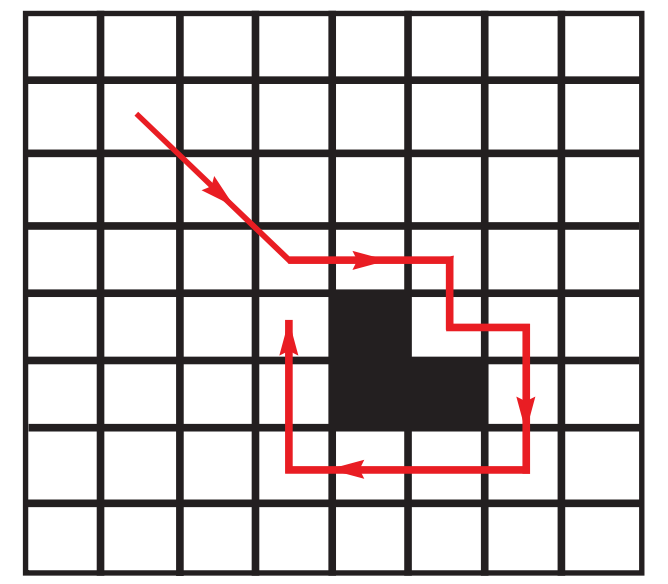
You have quite possibly seen automata not much more sophisticated than this, yet they dazzle the imagination with the notion that they may be intelligent in some way. A friend once wrote an entertaining program that featured Chaplinesque characters, including the little tramp and a big policeman who unwisely turned his back on the tramp occasionally, only to receive a kick in the seat. Both the policeman and the tramp were sprites – cartoon automata that moved according to a small set of rules rather than by thought and will. These automata were virtual: they existed only as representations on a screen, as does our blue dot in ROBOT1. Such a robot could be physically constructed out of a few components.

I have modelled the robot within a QBasic program, and include its source as well as its executable form on the **SuperDisc**. The robot has three modes:

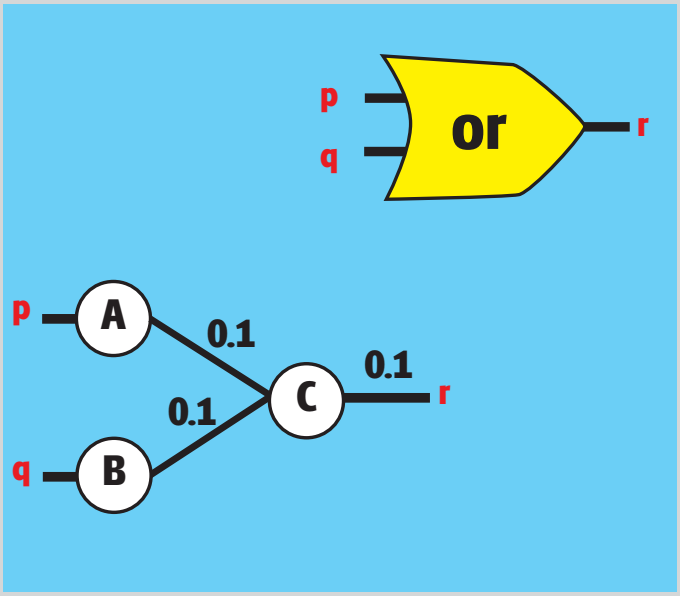
- ➜ When RED, the robot is off. You can tow it to any blank spot you like (using the direction keys). You can start the robot warming up by pressing ENTER.
- ➜ When BLUE, the robot is warming up. It is not operational, but its sensors function. When it has been put in warmup mode, you can use a directional key to push it in any direction. It will go in a straight line, and will go into automatic mode when it senses an obstacle in one of the immediately surrounding cells.
- ➜ When GREEN, the robot is operational. Its sensors will guide it around any obstacle it has encountered (including the perimeter of the whole field. You can turn the robot off by keying ENTER.

When I speak of the directional keys I mean the arrow keys and also the keys of the numeric pad (7 indicates a move to the northwest of the current cell). The program does not care about the status of the NumLock.. You can terminate the program by keying ESC.

Consider that the robot works predictably, sensibly, without any memory – just a few rules. When placing obstacles randomly over the field, I had to make checks that the configuration would not create a trap for the robot: two obstacles close together will cause it a dilemma, and it will become



↑This mindless automaton has no memory, so when it has walked around an obstruction in an orderly way, it can only keep doing the same thing. It is in the same state, with the same conditions presented to it. Unless interrupted, or the layout changes, the robot will continue forever marching around the object in the same way.



↑The logical OR gate is the easiest to simulate with a neural net model: when there is no input, no signal reaches the terminal neurone C. Input into either A or B (or both) triggers output from C, producing the correct response.

trapped. To overcome traps, the robot would have to have a memory so that it could react differently.

It may be more interesting if the robot were able to realise when it had already circled an obstacle completely: at that point it could go off and look for something different. This again requires a memory so that it can mark when it has gone completely around the object. Why not think through the design of ROBOT2 that would operate in the same way, but could act differently the second time it came to the same cell, and at the same time created a little map of the field in its memory. Can you devise rules that would ensure that all available cells were visited?

Workshop activities are continued on this month's **SuperDisc**, where we continue further with the subject of representing very large amounts of data in tables. There is also a discussion of how we set up the 'sensors' used in ROBOT1. PCP

Write in!

→I'm always pleased to receive letters and e-mail with programming queries, ideas and opinions, As a strict rule I can't reply directly with personal one-to-one programming advice, but your input could form the basis of a future Workshop. You can e-mail me at whey@pcpmag.co.uk. Fax to 01225 732295 or write to Wilf's Workshop, **PC Plus**, Future Publishing, 30 Monmouth Street, Bath BA1 2BW.

→ Neuro-Logical

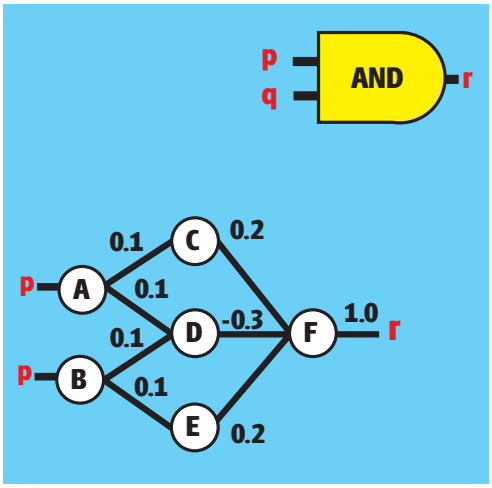
Phil Stone contacted me by e-mail, wondering how the human mind, made up of neurones, could be used to think logically. "Obviously, if my brain works like a neural network, and I can think in terms of AND and OR logical gates, then I should be able to model simple logical circuits on a small neural net. I can't see how to do this. Can you show how it can be done?" You may find it surprising that the relationship is simple and direct: AND and OR gates, in particular, can be modelled with just a few neurones.

OR is easy to accomplish, because essentially a single neurone is a super-OR gate, with a threshold mechanism built into it. In this example I have used neurones A and B just to make the two inputs quite distinct, and so that it was easy to put a low weight on each. The resulting sum of signals going into neurone C is enough to trigger it even if only one of the two inputs is present.

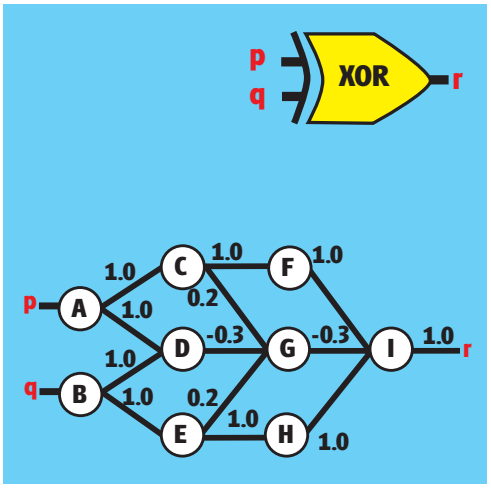
AND is a bit more complex: neurone D takes the result of A OR B, as above, but turns this into a negative signal. Suppose there is a signal at A but not at B: Neurone C will fire, and so will neurone D. But these sum to a negative value at neurone F, so it will not fire. The only circumstance under which neurone F will fire, it transpires, is when A and B both produce signals. Note that this can be simplified slightly by wiring A and B directly to F, both with a signal weight of 0.2. This gets rid of two neurones, but breaks the (arbitrary) rule about connections being make only between consecutive 'banks' of neurones.

XOR is a bit of a challenge: it combines both the OR circuitry (see F, H and I) and the AND circuitry (C,D,E and G). The result of G also affects neurone I: if it fires, it more than compensates the contribution of neurones F and H, and so if neurone G fires, neurone I will not.

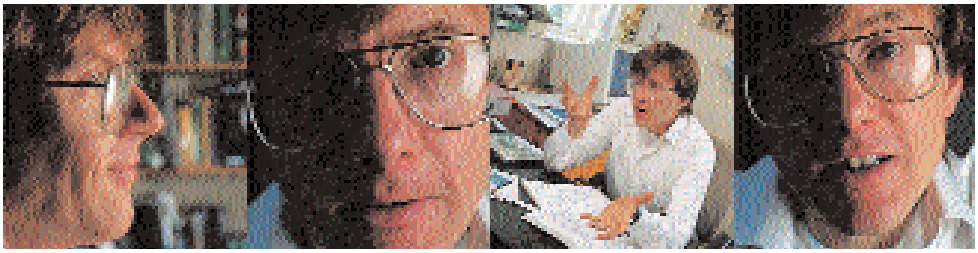
These three examples illustrate all you will need to model any of the logical functions, including NOT (just feed the signal into a neurone, and put a negative weight on the output) and IFF (if and only if: the reverse of XOR).



↑The logical AND gate is a little more complex to model with a neural net. Neurone D is triggered when there is any input (A or B or both), but its signal is negative. The sum of signals reaching the F neurone is only positive if both C and E are triggered, which depend on A and B respectively.



↑The logical XOR gate is yet more complex in a neural net form. The result at G is the same as the AND gate, but it feeds onward as a negative signal. Effectively the XOR model is p or q, but not (p and q).



Huw**Collingbourne**

Huw Collingbourne has a gay day with Larry Grayson – but still thinks the telly is naffer than the Net

Nobody was gay in the 1970s. Nobody you'd ever heard of anyway. Larry Grayson was one of the most popular TV personalities of the day. Camp as a pair of frilly knickers, he had a range of outrageous catch-phrases including the unforgettable 'What a gay day!' And yet, as far as his devoted audience was concerned, the man himself was as straight as a ten bob note. When he announced that he was planning to marry Noele Gordon (Meg from TV's *Crossroads*), most of his devoted viewing public found there to be nothing extraordinary in the idea.

Grayson wasn't the only camp comedian of his day. *The Dick Emery Show*, *Are You Being Served?* and *It Ain't Half Hot Mum* all featured characters whose principal comic qualities were their effeminacy. Some comedians, such as Frankie Howerd and Kenneth Williams, made an entire career out of being camp. It seems oddly depressing that while Grayson, Howerd and Williams were all homosexual, not one of them owned up to the fact. This only became public knowledge after their deaths.

These days there are innumerable openly gay comedians, actors, chat-shows hosts, pop stars and even, amazingly, politicians. Back in the 70s, the only gay role models on the big or silver screen were either of the suicidal, self-loathing variety in 'hard hitting' dramas or the light-as-froth, mincing variety epitomised by Grayson.

Today's teenagers may have grown up in a more liberal society, but sometimes it's mum and dad that have to come out to the kids

Given the choice, many of us found Grayson to be the more appealing alternative. Which probably explains why, to this very day, I still can't stop myself from shrieking "Shut that door!" and "You can kiss my astrakhan coat!" at least twice in almost every conversation.

Bearing in mind the invisibility of real-life gays during the 70s, it's probably not surprising that the process of 'coming out' was generally a pretty traumatic experience. These days, of course, we live in a far more liberal society. Even so, that doesn't mean that the process of coming out is necessarily trauma free. Today's teenagers may have grown up in a more liberal society, but their parents didn't! Besides, let's not jump to conclusions here. Sometimes it's mum or dad who has to face the prospect of coming out to the kids!

At least, it is now fairly easy for anyone with an Internet connection to get instant advice on gay matters. Anyone who's worried about giving the folks at home the Big News would do well to log onto 'Coming Out and Staying Out' (www.gmhp.demon.co.uk/coming-out/). The information and advice on this site is simple and straightforward. It provides a guide to 'what does being gay mean?' and advice on how to let other people know that you are gay. For the under 25s there is even a Gay Youth site (www.gayyouthuk.co.uk/) which claims to get 18,000 hits a month.

There are numerous sites providing links to gay pubs and clubs, businesses and organisations. The Gay Britain (www.gaybritain.co.uk/) and Gay Guide sites (www.gayguide.co.uk/) contain compendious UK directories. Even AOL, that most family-friendly of Internet Service Providers has an active gay section (keyword 'gay').

↑ **Larry Grayson was camper than Lily Savage or Julian Clary – and yet he wasn't gay. Or was he? Log on and find out.**

Mincing words

But you don't have to be an omi-palone to enjoy a bit of bona Polari. If you don't know what I'm wombling on about, just get up off yer corybungus and mince along for a varda at the fantabulosa Polari Wordlist (http://nz.com/NZ/Queer/Polari/polari.html), Chris D's Lattypage (www.chris-d.net/polari/) and Polari – A Cinderella Among Languages (http://members.aol.com/frij/). If you want to get really serious about it, check out Paul Baker's PhD research into Polari with the Department of Linguistics at Lancaster University (www.dollsoup.co.uk/stuff/polari.htm).

In brief, Polari is a gay/theatrical slang whose most famous exponents were Julian and Sandy, played by Kenneth Williams and Hugh Paddick, on the *Round The Horne* radio show back in the 1960s. While you're cruising cyberspacerama, why not take a troll down Memory Lane to the *Round The Horne* site (www.round-the-horne.co.uk/) and the Jules and Sand Bona Tribute Pagette, (www.fabulosa.force9.co.uk/page6.htm). Undoubtedly, Jules and Sandy's bitchy banter was a precursor of Larry Grayson's comic campery. Which, rather neatly, brings me back to where I started...

In his heyday, Grayson was as big as Lily Savage and Elton John all rolled into one (now there's a horrible thought!). In 1971, *TV Times* readers voted Grayson as being the funniest man of the year. In 1972, he topped the bill at the London Palladium and, by the end of the 70s, he

↑ Rhona, Ellen, Queer As Folk – you thought gay sit-coms were new? Log on to the Julian and Sandy site to discover the BBC's gay comedy from the 60s!

was presenting the *Generation Game*.

But, ironically, while Grayson was immensely popular with the mums, dads and kids, he was vilified by gay activists. Eventually, with the passage of time, Grayson's popularity faded and, by the mid 1980s, he was totally out of fashion. No doubt, had he lived (he died in 1995), he might well have come into vogue again. After all, if *Are You Being Served?* can make a comeback, I'm sure Grayson could have.

At any rate, Grayson has some fans on the Internet. On Kevin Orford's *Unsung Heroes* site (http://freespace.virgin.net/kevin.orford/) Larry Grayson shares top-billing with other forgotten greats such as Hylda Baker, Noosha Fox and Grayson's 'girlfriend', Noele Gordon.

Grayson has even made it into the groves of academe. The Lesbian and Gay Staff Association. of the South Bank University in London ('The Knitting Circle', for short), includes Grayson's biography among a list of other gay and bisexual luminaries (www.sbu.ac.uk/stafflag/index.html).

This biog is a veritable treasure trove of Grayson trivia. For example, did you know that Grayson's real name was William White? Or that he was so fond of fish and chips that he always kept salt and vinegar in the glove compartment of his white Rolls-Royce? In his younger days he performed in a show that toured the villages of Devon and Cornwall. In the show he would dress in drag with sequins, feathers, wigs and gowns. Well, I can tell you, we certainly don't get that class of entertainment in the villages of Devon these days!

A case of crabbes

Critics of the Internet might say that Larry Grayson trivia is about all it's good for. A surprising number of people believe the Internet to be essentially worthless and its educational content to be close to zero. Curiously, many of the people who express this opinion are journalists and broadcasters – people, in other words, whose jobs as disseminators of information and opinions are challenged by the growth of the Internet.

As a professional journalist myself (what d'ya mean, you never noticed?) I realise that in the long-term, my own job could be on the line. Or, to be more positive, let's say it might one day be online. All the same though, I am not a Net-knocker. Far from it. While there is a lot of trash and trivia on the Net, I am also constantly astonished by how much solid, detailed information is out there too.

Only this morning, I happened to be listening to a radio program about Benjamin Britten's opera, *Peter Grimes*. The presenter remarked that the opera had been inspired by a poem written by George Crabbe. Knowing next to nothing about Crabbe, I loaded up Microsoft's Encarta encyclopaedia to read a short biography of the man. This included a hyperlink to a Web site containing the text of *Peter Grimes*. I clicked the link and a few seconds later, there was the poem on my screen.

The poem forms part of the University of Toronto's Index of Representative Poetry (www.library.utoronto.ca/utel/rp/intro.html) which gathers together samples of poetry ranging from Beowulf to Bah Bah Black Sheep.

It's a sign of how much I've started taking the Internet for granted that I wasn't in the least bit surprised to find the Crabbe poem just minutes after hearing someone talk about it on the radio. Without the Internet, I can't imagine how long it would have taken me to track it down and, to be honest, I probably wouldn't even have bothered making the attempt.

And people say the Internet is trivial! Television fits that description better. At least, when I'm connected to the Net, I have complete control over which sites I visit. With television, I get only what I'm given. Most of the time this amounts to endless garden make-overs, quiz shows and programmes about vets. It's only a matter of time before they go the whole hog and broadcast gardening quizzes for vets.

Sure, the Internet has its share of tat, sleaze and stupidity. But, I'd argue that it's more rewarding than watching the telly.

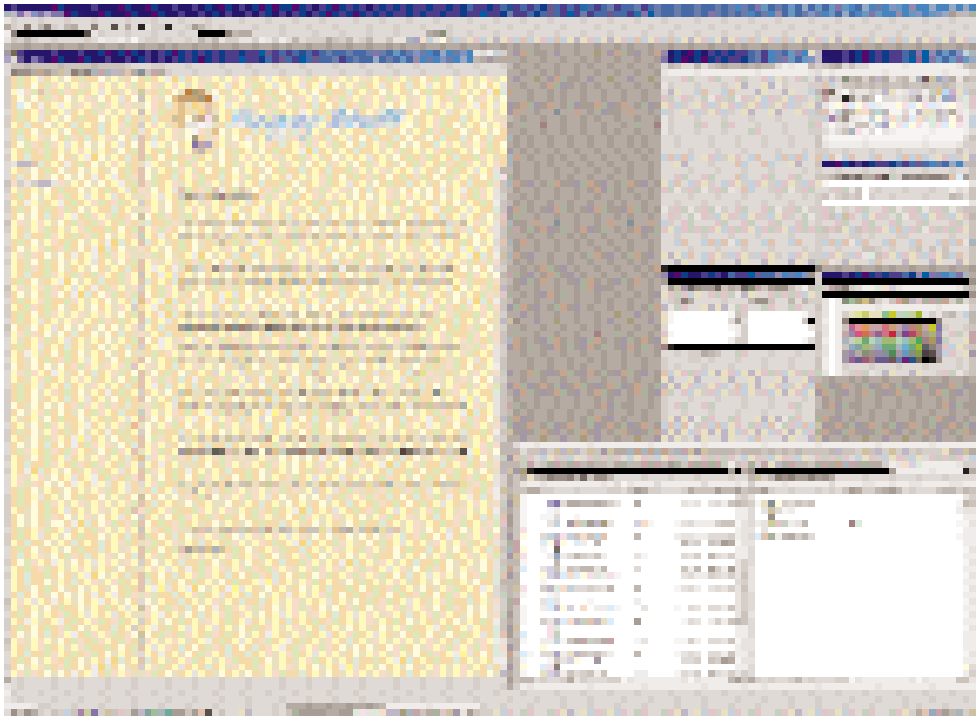
The last word

And finally... a few months ago, I wrote about my dislike of Microsoft's over-inflated and increasingly unreliable word processor, Word 2000. I have since tried out several other word processors but thusfar have failed to find a satisfactory replacement. I couldn't get on with WordPerfect at all (I particularly object to the lack of multi-window editing of a single document). I wasn't entirely convinced by Lotus WordPro either (just as big and complicated as Word – the adage about the frying pan and the fire sprung to mind). Of all Word's competitors, the word processor which has most impressed me is, rather surprisingly Sun's StarWord. This is all the more impressive since it's free (it's part of StarOffice 5.2 which was on the **SuperDisc** with issue 168 of **PC Plus**).

However, I do intend to be a bit cautious. A word processor is the single most important piece of application software in my working life. So making the switch to a new one is not a decision that I would take lightly. For the time being, therefore, I'm still using Word. However, I've had to take some measures to ensure that it doesn't randomly screw up my documents. My solution to this problem has been to save documents in rich text format (RTF) rather than Word (DOC) format. This option is set by selecting the Tools menu, then Options and clicking the Save tab of the dialog box.

Since doing this, Word has not corrupted any of my documents. RTF files also save valauble disk space – the RTF version of this column is 17k compared to the 31k DOC version. I'm not exactly sure what Word puts into its native format files but, whatever it is, I don't think I want it there.

huwcol@aol.com
www.treetops.u-net.com



←Adobe GoLive 5 provides the most wonderfully elegant and fluid interface, enabling you to design superb Web pages with minimum effort.

WEB AUTHORING TOOL

Adobe GoLive 5.0

PRICE £234 **EX VAT** £199 **ONLINE** www.adobe.co.uk
SUPPLIER Adobe **PHONE** 020 8606 4001

With greater native support for Web media and data types, GoLive just keeps improving

Adobe GoLive is already one of the best Web authoring tools available, combining drag-and-drop design, HTML source editing and support for a variety of code types including Java. However, the previous version was extremely buggy and it crashed at the drop of a hat. Nor was it particularly friendly to foreign code types. After what seems like an agonising wait, Adobe has finally released version 5, and it looks very promising indeed.

Although Macromedia's Dreamweaver is the preferred Web authoring choice for many professionals, the one thing that GoLive has over it is the cleanest, friendliest, most logical interface of any Web-design program. Adobe is already renowned for its excellent interface design, thanks to programs like Photoshop and Illustrator. Yet when a program needs to combine the visual design approach of a graphic artist, with the text-based interface required by Web coders, the challenge is on to come up with something that's both intuitive, functional and fluid. That's definitely where GoLive scores its points, as you move between windows using Adobe's patented tab system, which gives instant access to numerous windows without the need for menus.

GoLive is very much of a visual authoring tool, and you can quickly build engaging Web pages using the layout view. This represents the current page, and by dragging raw components from the palette, such as text boxes, graphics, buttons and so on, you can immediately build up an impression of how your page will look. I say impression advisedly, because having lovingly crafted a page, the program has a frustrating tendency of throwing spacing and colours gone out of the window in the final code. The program does offer a browser preview mode in which you can instantly see your designs in the browser of your choice, but it's little comfort to know exactly how your design has been ruined without knowing why.

One of the best new features for entry to mid-level Web designers is the range of native object formats that GoLive supports and recognises. To name but a few, you can place Shockwave Flash Movies, Quicktime videos, Streaming media files and Real Player G2 videos directly into your pages using the drag-and-drop palette.

Designers of professional sites are likely to be more impressed by the program's extensive support for forms, and its ability to link directly to back-end ODBC databases, making it easy to provide extensive product or service lists, complete with search facilities. With support for Active Server Pages via its Dynamic Link module, GoLive 5 is well equipped to help you leverage your site's e-commerce capabilities.

Another excellent new feature is smart support for Adobe image formats. That means that you can place a layered Photoshop document, or an Illustrator file on your Web page, then a simple double-click will open the native host program that generated it, enabling you to make any alterations. Changes will automatically be relayed back to your GoLive documents.

Sadly, the program is not without its flaws. One of the big claims for this version is something called 360° code. This means that the program will accept any code its native form without modifying it. The idea is that you can use emergent standards like XML safe in the knowledge that the program won't 'intelligently' pare out unrecognised code. However, we fed it certain sample pages and it crashed every single time. Admittedly it didn't modify them, but nor could we edit them within the program...

On another disappointing note, the program's spell-checker must be the most pitifully stupid in the history of the world, with the smallest vocabulary ever. It says much for the spell-checker that the word 'ignore' is misspelled in the spell-checker menu ('ingore'), and the program insists on treating pairs of words as single entity then claiming not to recognise them.

There are many additions both great and small to this version and, whether you're a new user or an existing one, you'll be delighted by the sheer speed with which you can build the most advanced of Web pages. Adobe GoLive 5 provides all the features I'd hoped for, except robust stability and rigorously-tested functionality. It's frustrating when a company as esteemed as Adobe continues to release wonderfully ambitious products that are improperly tested. Nevertheless, I'd sooner use GoLive complete with its occasional crash, than change design programs.

Mat Broomfield

Requirements
Pentium 200, 48MB RAM, SVGA display, 60MB hard disk, CD-ROM, Win98 or NT 4 SP3 or higher
Tested on
Pentium III 800, 256MB RAM, SVGA, 54GB hard disk, Win98 SE, DVD, ISDN Internet connection

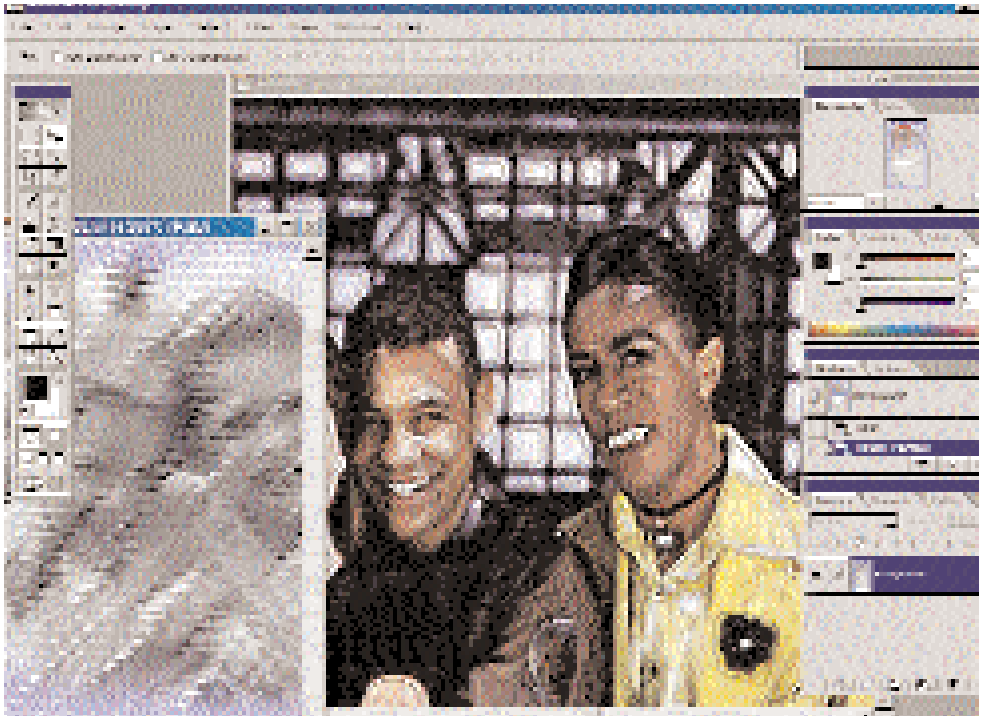
PCPlus Verdict

ADOBE GOLIVE 5.0

✓FOR
- Extensive native support for Internet media and code types
- Very intuitive and friendly user-interface
- Provides access to databases and ASP

✗AGAINST
- Woeful dictionary
- Still very unstable
- Manuals are not comprehensive enough

Specifications	10
Quality	7
Value for money	8
Performance	7
OVERALL	**8**



GRAPHICS PACKAGE

Adobe Photoshop 6.0

PRICE £469**, or** £147 for upgrade **EX VAT** £399**, or** £125 for upgrade **SUPPLIER** Adobe
PHONE 0131 458 6842 **BUY ONLINE** www.adobe.co.uk

Photoshop has been the benchmark paint graphics tool for the past decade. This new release boosts creativity even further

Photoshop has recently fought against fierce competition from cheaper and specialist graphics packages, especially those that incorporate the most fashionable tools and Web specific features. Version 5.5 tried to expand its usefulness with the bundling of ImageReady 2, and version 6 has taken a significant leap with a host of new features, ImageReady 3, plus interface refinements, all tuned to get your creative juices gushing!

The most significant shortfall of Photoshop has finally been resolved and will hopefully put an end to questions like 'how do I create a rectangle/triangle/circle?' A new shape tool can create basic shapes with an added surprise – the ability to create them as vector objects with point editing. So, if you were to draw a blue rectangle with curved corners and later decided it should be twice the size, and have a fifth corner added, Photoshop will oblige without compromising quality even if you enlarge them.

Apart from basic geometric shapes, there's a custom shape with a palette of other shapes such as arrows, hearts, moons, even a hand and foot shape, but the interesting part is the ability to create your own shapes. This can be managed from the Preset Manager, which is a new way of housekeeping shapes, brushes, patterns, styles, and gradients. Sets of presets can be loaded, saved and deleted from one location.

Requirements
Win98/2000/NT4, Pentium class CPU, 64MB RAM, 125MB hard disk space
Tested on
Win98, P550, 128MB RAM

Text warping

The text tool has undergone a major shake-up with on-canvas typing – no more messing around editing text in a separate window. It can be formatted and indented on a per-paragraph basis and justifications can be mixed within the same layer of text. Full justification, word wrapping, and hyphenation means text can be neatly and automatically formatted in a word processor fashion making it easy to apply columns of text to emulate magazine or Web page layouts.

As if the new vector tools alone weren't enough to stop a minority of people from buying Photoshop's sister program, Illustrator, Photoshop now sports a funky text warp tool that can bend and distort text into shapes from a list of 15 presets such as fish, squeeze and twist. Each one can be tinkered with and the text will remain editable, but you can't create your own shape, you still need Illustrator for that sort of manipulation. Saying that, Photoshop can convert text into vector shapes allowing points making up a letter to be moved and twisted providing a powerful way to indulge in typography.

You got style

Layer styles have been revamped with a new pop-up window with 13 effects, all of which can be used simultaneously, including new effects such as contour, stroke, and gradient and pattern overlay. Most effects are no longer restrained to being linear and can have their own contour (envelope) that visually describes the strength of the effect. For example, a shadow effect can run from solid to transparent to 50 per cent transparent to fully transparent, just by selecting one of the preset contours. If the presets aren't enough then new ones can be created and stored.

←Quickly create colourful effects and interesting text.

Other new features include the Liquify tool that warps and pushes pixels around in real time. There's built-in slicing and HTML exporting so you don't have to import Web images into ImageReady. Text and audio annotation enable comments to be embedded into Photoshop files. The crop and extract tools have been enhanced along with actions, triggers and batch processing. A new on-screen print preview will help to avoid printing cropped images .

A small but significant addition to Photoshop are collapsible layer sets so, hundreds of layers can be tucked away underneath folders in the layers palette for improved management.

ImageReady 3 has inherited most of Photoshop's new toys and can take them further by animating layer effects. Mouseover effects can be previewed within ImageReady and it also introduces layer-based slicing and weighted optimisation of JPEGs and GIFs based on a user-defined alpha channel.

Photoshop may not be the cheapest graphics package around but it's the most established with virtually every feature you could need, providing a powerful tool for serious artists and Web designers. Photoshop 6 is your licence for creativity – if yours isn't gushing now, it will be.
Gary Fenton

PCPlus Verdict

ADOBE PHOTOSHOP 6.0

☑FOR	☒AGAINST
→ Big creativity boost	→ The two programs should really be just one
→ Feature packed	
→ Industry standard package	

Specifications	9
Quality	10
Performance	9
Value for money	8
OVERALL	**9**

← Dual processors lift this machine into new levels of performance

DUAL PROCESSOR PC

Armari R8-A2000

PRICE £4,581 **EX VAT** £3,899 **SUPPLIER** Armari
PHONE 0208 993 4111 **ONLINE** www.armari.co.uk

The 1GHz Intel processor is impressive but Armari has squeezed two into one case for some special performance

With Windows 2000 becoming more prevalent, the idea that speed freaks could put together a system using dual Intel processors looked inviting. Would two 500MHz out-perform a single 1GHz? Well, Armari has been thinking along the same lines but not with a couple of relatively slow processors. Instead, it's gone the whole hog and built a system using two 1GHz processors and a lot of expensive RAM.

The R8-A2000 doesn't cut any corners; Armari has gone for an Intel OR840 motherboard using the latest Intel 840 chipset. This can usually be found on high-end servers but is equally at home as a fast stand-alone workstation. It can take anything from a single 533MHz processor up to a pair of the latest Intel Coppermine processors. Armari fitted two 1GHz Sot 1 processors with 133MHz front side bus. This board is also equipped with four Rambus RIMM sockets capable of holding up to 2GBs of memory. It's fitted 256MBs in the R8-A2000, 128MBs on each processor. I know I'm always going on about the price of Rambus memory but, in this case, it's the only way to go and gives the board an amazing 3.2GB/sec bandwidth using the 400MHz RIMM modules.

The board includes an Intel 10/100Mbps 82559 LAN adaptor and a 2 x Ultra ATA/66 IDE Disk controller. The network adaptor uses a standard RJ45 connector, so the box instals into most Ethernet networks without any problems. The onboard hard drive controller uses Ultra ATA/66 to connect to a massive 64.1GB IBM Deskstar 75GXP, one of the fastest and most reliable drives we've seen at **PC Plus**. Running at 7,200rpm, with an average seek time of 8.5ms this is capable of running at a transfer rate of almost 40MB/sec.

Armari has included several goodies one of which is the case. This is the Rolls-Royce of cases. Made of alloy, it comes in lighter than an equivalent steel case. It isn't massive for a tower case but does have room for three 5.25-inch external devices, two 3.5-inch external drives and 5 additional internal 3.5 bays. A 300Watt power supply and several extra cooling fans are fitted. You'll need that sort of power for the potential capacity of the case. The fans are quiet but one sits on top of the case blowing out vertically.

The appearance is 'technical' with a brushed aluminium facia and blue/grey panels all held together with chrome coloured finger screws. It matches the appearance of the excellent LaCie Electron Blue 19-inch monitor that looks suspiciously like a Mitsubishi Diamond monitor in evening dress.

Armari has installed both a CD/DVD drive and a CD-RW drive. The Pioneer DVD drive uses the slot method for loading. This is a fast 16-speed DVD and comes with Cyberlink PowerDVD software for watching DVD movies. The other drive is Plextor's Burn Proof 12 x 10 x 32 CD writer. I recently tested this and, in my opinion, you can't get a better writer. It uses WinOnCD for burning ROMs with Packet CD for the UDF filing system support.

Another feature that I must mention is the sound and graphics card. Armari has fitted a Sound Blaster LIVE! 1024 PCI sound card, powered by the EMU10K1 Hollywood quality, 32-bit digital audio sound processing and effects engine, giving full 360-degree 3D positional audio. The output from this card is fed into Cambridge Sound Works digital speakers in matching dark colours. The system includes 2 x 8W RMS satellite and a 24W RMS subwoofer. It will connect to standard analog output from other sound cards but does use the S/PDIF Digital connection to the SBlive or any DVD, CD, DAT and MiniDisc, ensuring quality audio reproduction with low distortion levels.

That leaves the graphics card. On the machine we reviewed, Armari fitted an nVidia GeForce2 Ultra 64MB AGP 4x Graphics Accelerator. This is blindingly fast and turned in some amazing 3D Mark results well over 5,200. However, nVidia let me have a look at its latest version of this card, this will be fitted to future models of the R8-A2000 and on testing in even faster times at almost 5,400 points in 16 bit colour – very impressive.

The R8-A2000 is for speed freaks. It turned in the highest benchmarks ever seen for both graphics and processor performance. It would be a shame to tuck away this machine and use it as a server. It needs to be on show, ideally on my desktop – absolutely fabulous.

Paul Warner

PCPlus Verdict
ARMARI R8-A2000

✓FOR
- Ultra fast
- Great build quality
- Superb graphics

✗AGAINST
- The price
- This kind of machine really demands a flat panel display

Specification	10
Quality	10
Performance	10
Value for money	7
OVERALL	**10**

Essential reading

Wilf Hey reviews the newest books

PCPlus EDITOR'S CHOICE

←Running Microsoft FrontPage 2000 is the perfect guide for creating your very own Web site

http://mspress.microsoft.com

Running Microsoft FrontPage2000 (Bk/CD)

A must for all aspiring Web developers

PRICE £29.99
AUTHOR Jim Buyens
PUBLISHER Microsoft Press
ONLINE http //mspress.microsoft.com
ISBN 1-57231-947-X

This excellent volume contains over 800 pages of well-presented material that will guide even a beginner through the process of creating and caring for a Web site using the famous Microsoft package and its host of support tools.

The guide is divided into five parts, it serves both as a helpful manual and as a handy reference.

The first part takes a high-level overview of web publishing through FrontPage 2000, reviewing the fundamental philosophy of the package and then discussing its major features. The second section is the meat course: it shows in detail the many aspects demanding attention when creating Web pages. The chapters in this section are particularly well illustrated with screen depictions, and directions are precise and easy to follow. Much sage advice is offered about how to make pages that are both efficient and effective, though the author does not lock the reader into following a strict style.

Previous versions of FrontPage normally expected a Web server on the PC used for Web authoring; the lifting of this restriction in FrontPage 2000 is welcome, but seriously affects factors such as the ability to interface databases. So, the third section develops the theme of managing those extra features associated with a personal Web server.

The fourth section delves deeper into the more specialised and expert applications of Web server interaction, especially using FrontPage Webs (collections of Webs as well as individual pages). The final section deals with Web site maintenance through FrontPage (in particular, getting your Web together and running), and it also offers one of the clearest tutorials that I have seen.

This book covers the effective use of FrontPage for Web creation and publishing in a thorough fashion, and copes well, providing timely help for the inexperienced and the expert alike.

PCPlus Verdict 10/10

PRICE £27.49
AUTHOR Martin Matthews
PUBLISHER Microsoft Press
ONLINE http://mspress.microsoft.com
ISBN 1-57231-931-3

http://mspress.microsoft.com

Windows 98 Companion

This book suffers from having to be all things to all people: a handbook to explain the basic concepts and functional interfaces of Windows, and a platform to preach the good news of improvements in Windows 98 over previous versions.

It seeks to be a chatty aid, taking the edge off brittle, impersonal manuals that may convey essentially the same information (how various features work, how to utilise resources effectively, and similar themes) but it fails, because you will definitely want, or need, to have other detailed documentation available. Then this book becomes dispensable, or even obsolescent.

It is perhaps effective as a self-administered tutorial for somebody currently doing another job, but soon required to move into Windows 98. The information it provides is sound, pleasantly communicated, and well illustrated.

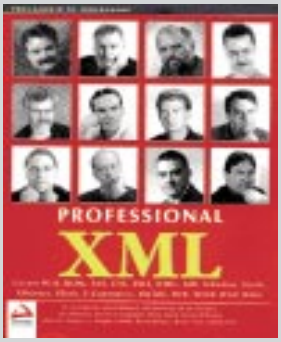
The overall layout of the complete volume is quite pleasant, and there has even been obvious attention paid to the typeface, the colour and whitespace.

All said, reading this book is a pleasant enough experience, but do not expect any dramatic insights, or tips that save large amounts of your hard earned dosh.

Other manuals are almost positively essential in order to give you the knowledge needed to exploit the power of Windows 98.

This companion is the more user friendly introduction and is better suited to first time users than those with a wider Windows knowledge.

PCPlus Verdict 6/10



PRICE £35.99
AUTHOR Didier Martin et al
PUBLISHER WROX press
ONLINE www.wrox.com
ISBN 1-861003-11-0

www.wrox.com

Professional XML

This is a book – perhaps I should say THE book – for serious programmers wishing to find their niche in the Internet-based future, forecast by most of the industry's prognosticators. XML is the mark-up language that has taken over in so many respects, open sourced, flexible and extensible, compiled by a panel of expert programmers, it provides not only its syntax in clear fashion, but imparts a good deal of combined personal experience.

It illustrates the power of XML through extended case studies, so that the involved reader can absorb the wisdom normally gained from months of experience in the 'deep end of the swimming pool', where mistakes are costly and reward is reserved for success alone.

This book of over a thousand pages will grab the interested programmer and will not disappoint.

The primary drawback is that you will have to get online to obtain source materials used and mentioned in it, an accompanying CD would be welcome, and is sorely missed.

There is plenty of practical information about XML and related languages, features, engines, APIs and structures, including W3C DOM, SAX, CSS, XSLT, XLink, XPointer, BizTalk, WML, and WAP (the mini-markup language used by mobile phone connections to the Internet).

There are several useful and well designed appendices, and a superb index. This is, it should be noted, a book designed for experienced programmers by experienced programmers.

PCPlus Verdict 9/10

BRIEF ENCOUNTERS

→ The bit of the mag where we get short and to the point...

Mustek Gsmart 350 digital camera

PRICE £129 **EX VAT** £110
SUPPLIER Mustek
PHONE 0800 038 0800
WWW www.mustek.com

Mustek has launched a more traditional looking camera in the shape of its Gsmart 350.

The technical specs of this device are quite impressive, there are two resolutions: 640 x 480 and 320 x 240. The built in internal memory can store up to 12 images in low resolution mode and the camera uses a USB Interface plus it has a Self timer and digital zoom. Using the camera was very easy, and it can double as a desk based device but the quality of the pictures was very poor. If you're looking for a digital camera we sadly recommend that you spend a bit more.

PCPlus Verdict 6/10

Logitech Wingman Rumblepad

PRICE £30 **EX VAT** £26
SUPPLIER Logitech
PHONE 01753 870900
WWW www.logitech.com

This game pad looks like the Wingman joy gamepad which was launched last year but with added features including two motors that provide vibration feedback which is great when playing any game which might involve contact.

There is also a programmable function button, a throttle for flight sims and two analogue joysticks, which gives more accurate control in the aforementioned flying game genre. This pad is comfortable to hold and it feels like it is built to last. Overall its well worth looking at but only if your machine is USB equipped.

PCPlus Verdict 9/10

Eurotech USB to Ethernet 10/100 adaptor

PRICE £40 **EX VAT** £34
SUPPLIER Eurotech
PHONE 0870 458 0118
WWW www.euro-tech.co.uk

The Eurotech USB-based network adaptor is easy to install: plug in the USB connector and wait for the computer to ask where the drivers were. After loading, rebooting and telling the machine to use this network adaptor, instead of the default one, ran smoothly.

I was able to surf the Net and read e-mails via our network system. It's a great adaptor but it's only really useful if you have a sealed 'EasyPC' or no free PCI slots. It is also double the cost of a normal adaptor and other than USB connection we can't really see the benefits.

PCPlus Verdict 7/10

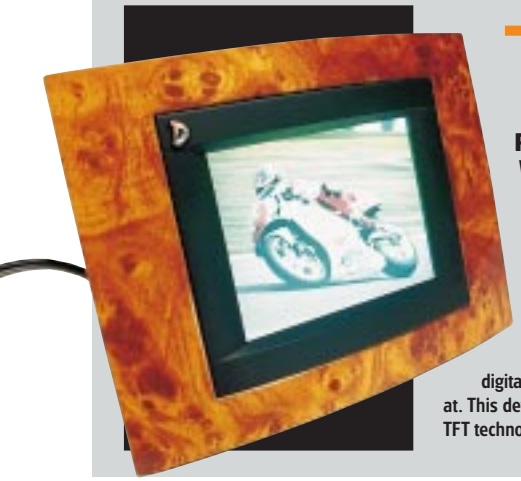
Iomega ZIP CD-RW 650MB 8 x 4 x 32 drive

PRICE £179 **EX VAT** £152
SUPPLIER Iomega
PHONE 0208 563 1324
WWW www.iomega-europe.com

This new CD-RW drive comes with disks that can hold up to 250MB of storage information which is large enough to back up lots of important files. The blank CDs hold 650MB each and can be read by any PC with a CD player, meaning 99 per cent of them.

This new model is Iomega's second stab at the market, after their 4x Write drive which was released last August. The new ZIP CD650 now has 8x Write, 4x Rewrite and 32x Read speeds and it's very easy to fit. Another added benefit to this improved model is that it's decently priced.

PCPlus Verdict 8/10



→ DigiFrame Digital Picture Frame

PRICE $599 **SUPPLIER** DigiFrame
WWW www.digi-frame.com

Have you seen the film *Back to the Future II*? If you have, you may remember the part where a 40-year-old Marty McFly goes into his house and promptly hits the video window because it was on the blink. Rather than displaying lovely picturesque scenes, it was displaying rubbish.

Video windows haven't yet been invented, but digital picture frames have. We were sent one to have a look at. This device is a 5.62 LCD display unit that uses Active matrix TFT technology. By using the built in serial connector or the two memory cards slots (one for Smartmedia and the other for CompactFlash) you can download images that you have taken with your digital camera and then display them as a portrait or landscape orientation.

The frame can also act as a slide show and you can display up to 500 images as a constant reminder of good times. The DigiFrame comes with several coloured frames and a clear display and we feel that this is a fantastic idea. The trouble is that it adds complicated technology to something that was already as simple as A,B,Cand it's horribly expensive.

PCPlus Verdict 8/10

Thomson Lyra MP3 Player

PRICE £199 **EX VAT** £165 **SUPPLIER** Thomson
PHONE 01732 520936 **WWW** www.thomson-multimedia.com

Now that Napster has more or less come to the end of the line, will it mean the end of MP3 players such as this one? I think the answer to that is no. CD personal stereos may be good but they're much too bulky and personally I feel solid state devices are the way to go.

Record companies have already noticed that the Internet is a vast virgin territory to explore and make more sales, possibly with tracks that you pay for to be downloaded on a Pay per Play basis. These types of downloadable singles are currently under-development.

Whatever format the record companies come up with, the Thomson Lyra MP3 Player will be ready because it is firmware upgradeable. This means that it can be programmed to play a variety of future formats as well as MP3s, so it won't be obsolete if MP3 are no longer used.

All in all, this is a pretty good MP3 player which comes with a 64MB and brilliant sound quality.

However, I do have two complaints. The first is its awkward parallel connections and the second being the slightly bulky size which makes it a harder task to carry around a so called portable machine.

PCPlus Verdict 9/10

Matsucom On Hand PDA watch

PRICE £200 **EX VAT** £170 **SUPPLIER** Sanderstead Senses
PHONE 020 8657 1172 **WWW** www.onhandpc.com

I bet you're thinking, 'Hold on a minute did I read that title correctly, Matsucom On Hand PDA watch?, PDA as in Personal Data Assistant?' Well the answer is yes.

Thanks to miniaturisation you can now get a variety of watches that come with handy built-in extras such as remote controls for stereos, GPS tracking systems and even MP3 players. These watches have been designed by the watch making giant Casio but Matsucom are the first company to integrate a full functioning PDA into a time piece. As expected, this watch is a bit bigger than the norm, but it's still comfortable to wear for long periods of time. However, you will look like you've just beamed off Captain Kirk's Enterprise.

This watch has an amazing list of abilities, as well as telling the time. There's a built-in game and a PIM scheduler. What's more, there is a file viewer and it's compatible with most desktop based organiser type programs. If you like PDA gadgets and don't mind the small screen, buy one quickly.

PCPlus Verdict 8/10

POCKET PC

Casio Cassiopeia EM-500

PRICE £400 **EX. VAT** £340 **SUPPLIER** Casio **PHONE** 020 8450 9131 **WWW** www.casio.co.uk

The Cassiopeia EM-500 is a Pocket PC with the emphasis on multimedia. Packed with software and very well priced

In keeping with the rush to be different which Microsoft's Pocket PC operating system has inspired in hardware partners, Casio has released another Cassiopeia onto the market, the EM-500, with some interesting features. It is squarely targeted at the younger user and, unashamedly, the consumer markets, and is the first Pocket PC device to have either of these accents.

The design of the EM-500 reflects this different market with a blue/mauve front with back cover and silver sides being the key physical features. The packaging emphasises that this is a mobile multimedia device. The box front states clearly that the EM-500 provides stereo MP3 output and movie playback, a sticker announces the presence of software for WAP, SMS, e-mail and the Internet. The presence of the PIM and other features of Pocket PC, take second billing.

The WAP element comes in the form of a WAP browser which is accompanied by Mobile E-mailer, a tool to help you use Microsoft's own Inbox software and Pocket Internet Explorer. There is no internal modem though, so you will need to make other connectivity arrangements. If you have a Compact Flash modem and think you can use this with the EM-500, think again. The strangest thing about this handheld is that there is no CF slot.

Expansion is provided instead by a single MMC (MultiMedia Card) slot. MMC is an up and coming storage medium which, so far, has made its main impact in MP3 players and digital cameras. MMC cards are small – smaller than a postage stamp, and storage capacities currently go to 32MB, though higher capacity cards are in the pipeline. No cards are supplied with the EM-500, so I tested the unit with tracks stored on several 16MB MMC cards of my own. The quality of the sound through headphones is fair. With only 16Mb of RAM on the EM-500, you will need to invest in MMC cards if you want to make full use of it as a music player.

Casio has always been good at bundling software with its handhelds, and there is more on board. Mobile Calendar and Mobile Address Book share information with Pocket Outlook and make it more presentable providing nice daily and weekly schedule views, using colour to allow you to differentiate types of event. MTDS Phone Manager helps you organize the contents of your mobile phone. There are other tools and utilities both on ROM and on the installation CD.

Requirements
Specifications
MIPS VR4122 processor running at 150MHz, 16Mb RAM, 65,536 colour display (240 x 320 pixels), lithium ion battery with quoted life of 7 hours, infra red port, 1 x MultiMedia Card slot, built in microphone for voice recording stereo output to headphones.

The display is strong and clear – very bright at its brightest and capable of 65,000 colours. Casio says the rechargeable lithium ion battery that supplies power to the unit will last for 7 hours, though clearly if you do intend to use the EM-500 as an MP3 player it will drain more quickly than this. The processor, a MIPS VR4122 model, runs at 150MHz, which is faster than the processors that were used in the first generations of this kind of handheld.

PC connectivity is provided via either USB or serial cable. You still need to use a docking station for this – it is a matter of personal preference, but I'd like to see the back of these. At least you can charge the unit without recourse to the docking station, and Casio provides both USB and serial cables.

←Casio's EM-500 looks very good indeed, performs well, and comes with a strong array of software. It is a winner.

Casio has always been strong on the multimedia aspects of its handhelds. It was the first to include MP3 and video players, and first to use the joypad like directional movement button that has been copied by Compaq in its new iPAQ and makes another appearance here. It is probably no surprise that they have made this foray into the consumer sector. With all the Pocket PC tools (which I've simply not had space to mention although they are standard on these machines), as well as the multimedia extras the Cassiopeia EM-500 is a very well featured palm sized device. It looks good too, and pricing is competitive.

However, I do have two qualms both relating to data storage. 16MB of RAM is rather low – once you start adding e-books for Microsoft Reader, MP3s, e-mails and the odd additional application, it will disappear very fast, and the choice of MMC cards is a mixed blessing. They are small and easily lost (take my word for it!), still a relatively new technology, and aren't as yet proven to have the staying power of CF cards.

There is a lot of competition in the storage arena. Let's hope Casio has not built in an unnecessary problem for the success of the EM-500 – at this stage I won't hold it against them.

Sandra Vogel

PCPlus Verdict

CASIO CASSIOPEIA EM-500

✓FOR
- → For excellent software bundle
- → Nice hardware build
- → USB and Serial connectors provided

✗AGAINST
- → MMC card expansion

Specification	9
Quality	10
Performance	9
Value for Money	9
OVERALL	**10**

MP3 PLAYER

Creative DAP Jukebox

PRICE £399 **EX VAT** £339 **SUPPLIER** Creative **ONLINE** www.europe.creative.co.uk

Creative's Jukebox looks great, sounds fantastic and is oh so desirable

The Digital Audio Player Jukebox is the largest portable MP3 player ever made. The reason? Simple: it contains a 6GB notebook hard drive that can store up to an incredible 150 albums at a time. You only need a few more facts: the sound quality is excellent, the PC software connectivity is simplicity personified and the Jukebox's interface, although difficult to get the hang of, lets you do almost everything you could possibly want. I would tell you to get out there and buy one right now, were it not for one tiny thing: the price. At a pound shy of four hundred, perhaps you need to know a little bit more before you part with your pocket money.

Let's tackle the basics first. The Jukebox, as you can see from the photograph, is a seriously good-looking piece of kit. Designed to look similar to portable CD players, so as not to frighten off non-technical punters, it is actually a solid-state device (no moving parts) with the exception of the hard drive. The first person I showed it to spent a good ten minutes trying to open it, to see where the CD went, though I hurriedly snatched it back when he started prising the LCD screen off with a pen. Music is actually piped into the Jukebox through the USB connection, from your PC, using Creative's PlayCentre 2 software. This is very well designed, with a window on the left where you can see audio CDs and files on your PC, and a window on the right, where you can inspect the contents of your Jukebox.

Transferring files to the player is as easy as clicking the Transfer button, and ripping audio CDs to the Jukebox is almost as simple. Pop your favourite *Black Sabbath* CD into the drive, select all the tracks to copy, and sit back and relax. The software chugs through an entire album, encoding the tracks into MP3 and transferring the files to the player in about 15 minutes. Not bad at all and it'll be even quicker if your CD drive is faster than my 10x.

So it looks fabulous and the PC software is easy to use, but what about the Jukebox itself? Well, despite being extremely compact, it isn't really small enough to carry around with you all the time. Like a portable CD player, it's designed to be carried in a bag, between your home, office and car. With this in mind, there is a well thought-out locking switch that stops it being turned on or off accidentally. Also, jumps and skips in the music are eliminated by an 8MB RAM buffer. This also helps reduce power consumption and extend the life of the supplied rechargeable batteries to around eight hours.

Once you've got it in front of you, the control panel is a little intimidating. There are the usual Play, Stop, Rewind and Fast Forward buttons, with the first two also controlling the power. On the right side of the player are two further buttons for scrolling through the lists and choices that appear on the screen.

There are two main sections to the software on the Jukebox: the Library and the EAX and System Menu (the two buttons on the left). The Library lists all the music on the player, by album, artist, genre or play list. Play lists are yours to create: pick the songs you want and save them under a title of your choosing. It's not the easiest process in the world and this is one area where you'll definitely need to read the manual, but it does make the management of so many tracks and albums simpler, if you're prepared to put a bit of time into learning the interface. The EAX and System Menu controls the Jukebox's settings, from power save mode on the backlight to your preferred environmental audio effect, such as hall, cave, arena and living room.

← **One day, all computer hardware will look this good.**

It may be four times the price of many MP3 players, but the Jukebox has one huge advantage: the 150-album capacity. You don't need to buy extra memory cards or constantly change the information on the player. Instead, it's all there, all the time, just waiting for you to press play. And if you're worried about future compatibility, Creative have promised to produce regular updates to the player's interface system, including non-music file storage and the ability to play other formats, such as WMA, Microsoft's alternative to MP3. In short, it's the MP3 player we've all been waiting for; if you can't afford it now, start saving.

Adam Evans

Requirements
Microsoft Windows 98 or 2000, 200MHz processor, 32MB RAM, 12MB hard drive space, USB port, CD drive with digital audio extraction support

Tested on
Windows 98
Pentium III 700
128MB RAM

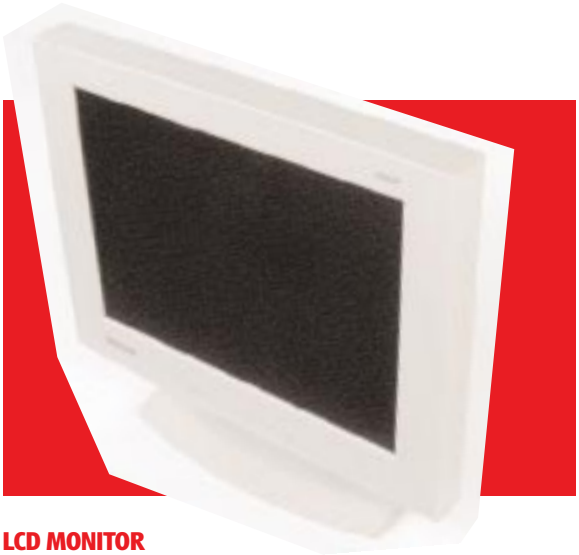
PCPlus Verdict

VERDICT HEAD

☑FOR
- → Gargantuan storage capacity
- → Looks fabulous

☒AGAINST
- → Expensive
- → Interface is not all that intuitive

Specification	10
Quality	9
Performance	9
Value for money	7
OVERALL	**9**



LCD MONITOR

Hansol 500F

PRICE £704 **EX VAT** £599 **SUPPLIER** Hansol
PHONE 01252 360400 **ONLINE** www.hansol.com

The Hansol 500F may be expensive, but the extra cost offers a good quality LCD

Prices of LCD flat-panel monitors aren't dropping as they should and even Hansol, known for its conventional budget monitors, has to pitch its 500F at just over £700. This will buy you three, good 17-inch conventional displays, so it needs to offer something special to justify its higher price.

Specifications
1,024 x 768 resolution, 15.1-inch, 18-bit colour (262K colours) LCD. No sound or USB outputs

LCD monitors have two key advantages over conventional devices: they take up a small fraction of the space and their screens have the potential to be far more precise. The first part is certainly true of the 500F, which takes up very little room and is a direct replacement for a conventional monitor. In order to get started, this LCD doesn't require any special software and will install under Windows as a Plug and Play device.

← Few extras, but the screen display on the 500F is as good as monitors costing more.

Its 15.1-inch diagonal is a true dimension. Unlike the diagonal on a standard CRT monitor, where the viewable picture is around an inch smaller than its nominal size. A 15.1-inch LCD actually gives you a screen roughly mid-way between a 15-inch and 17-inch conventional tube.

The screen resolution of the 500F is 1,024 x 768 and this is the resolution you need to run it at. If you go any lower then you will either have a small screen showing in the middle of the full display, or, the screen is rendered up to full size. Neither of these solutions are ideal.

Even 1,024 x 768 isn't as precise as you might think it is, as this is an analog device which converts the analog signal from a normal video adaptor to the digital signal which the panel needs. This conversion process is never perfect, so you may need to make adjustments to the picture.

This can be done with the use of five buttons under the screen, which are easy enough to use, though, to my mind, it's more normal to have the decrease /-/down button to the left of the increase/+/up button. Hansol has them the other way around.

The picture quality is clear and reasonably bright, not as intense as from a conventional tube, but similar to other LCD panels in this price range.

Overall, it's a good, no nonsense screen, but the best solution would be a digital-to-digital link (the kind you find in most notebooks) and this is still not available in a budget LCD monitor.

Simon Williams

PCPlus Verdict
HANSOL 500F

☑FOR
- → Easy to install
- → Compact size
- → Good contrast

☒AGAINST
- → Expensive compared to CRT monitor
- → Unusual control layout

Specifications 6
Quality 8
Performance 7
Value for money 6
OVERALL 7

SCANNER

Hewlett-Packard ScanJet 5370C

PRICE £179 **EX VAT** £150 **SUPPLIER** Hewlett-Packard
PHONE 08705 474747 **ONLINE** www.hp.com

Hewlett-Packard has launched a new high-end scanner but is it any good?

Scanners are very popular at the moment, mainly because of the amount of people creating Web pages. Hewlett-Packard isn't a major player in this field but it is hoping to be with the launch of its new ScanJet 5370C, which is one of three new additions to the ScanJet range.

Requirements
90 Pentium, 4x CD-ROM, 32MB of RAM, 100MB of hard drive space
Tested on
IBM PIII 500, 128MB, 13.6GB hard drive, Windows 98SE
Extra information
Comes with lighted transparency adaptor and Parallel and USB leads

The ScanJet 5370C sits near the top end of this collection and its target audience are home users and the small office. There are some advanced features on the 5370C such as the bundled lighted transparency hood and a high 42-bit colour depth, so it's not really aimed at the beginner. However, thanks to the in depth instructions supplied by Packard with the product, you don't have to be a computer genius to use it or to set it up.

← The Hewlett-Packard Scanjet 5370C produces high quality scans at a competitive price

Getting Started

Unpacking the scanner and getting it ready for use is easy enough, and the actual footprint of the device isn't much bigger than the norm, but it is quite long. This product looks like a typical HP; a good sturdy build quality and the standard Packard grey casing. There is one difference though, there are four, blue quick access buttons that enables the use some extremely useful added fuctions, for example, you are able to scan, print, e-mail a scan or fax it to another person.

Technically, the ScanJet 5370C is up there with the best of them. It has an optical resolution of 1,200dpi and an interpolated resolution of 1,200 x 2,400dpi and you can even link it into a network if you want to.

Using the scanner is also very easy, and it comes with a variety of software packages including Caere PageKeeper, Corel PrintOffice 2000 and PrecisionScan Pro 2.5, which has optical character recognition software built-in adding to the quality of this scanner.

The quality of the scans were very impressive. Skin tones were reproduced accurately and natural looking and also very quickly. The Scanjet 5370C is a decent high-end scanner which is favourably and competitively priced for what is offered.

High quality scans, excellent performance and good value for money are just three of the many reasons to purchase the Scanjet 5370C.

Tony Browne

PCPlus Verdict
HP SCANJET 5370C

☑FOR
- → Comes with transparency adaptor
- → USB and Parallel connection
- → 42-bit colour depth

☒AGAINST
- → Stodgy looks
- → Large footprint

Specifications 9
Quality 8
Performance 9
Value for money 8
OVERALL 8

The Intel InBusiness E-mail Station is a breeze to install and simple to use.

E-MAIL STATION

Intel InBusiness E-Mail Station

PRICE £535 **EX VAT** £455 **SUPPLIER** Insight **PHONE** 0870 700 7350 **ONLINE** www.intel.co.uk

Could this little grey box be the answer to all of your SOHO prayers?

As hard as it is to believe, not everyone has the budget to install a leased line and expensive routing equipment to get their company on-line. I myself spent a couple of years working with an SME that was split across multiple buildings. Two of the buildings contained a computer with a modem hanging off the back of it – both of these machines were in constant use by the staff they were assigned to, so if you wanted Net access you were pretty well stuck.

It is in to this sort of situation that the InBusiness line of products from Intel steps in. We only have the e-mail portion of the range here, but in addition to this, you can also add router modules, print servers, file servers – and much more besides. The idea behind the e-mail station is really quite simple – you have a mail account with an ISP that receives mail for several individuals. Periodically, it dials up the Net and gets your mail, then separates it in to multiple POP accounts that the users on your network can then download mail from.

Installation

Installing the administration software couldn't be easier. When you first run the software, it connects to the server and walks you through a simple wizard for setting up most of the options you will initially need to set. You start, crucially, by ensuring that that the time and date are correct on the server, then determining the connection method. If you purchased the InBusiness router, you can connect to that through a serial cable, or alternatively use the serial port for a standard modem.

After that, there are three main mail delivery methods to choose from. Methods A & B allow you to manage your mail accounts, either by SMTP or POP3, and method C specifies that your ISP will be managing your accounts. After specifying the server details of your ISP, and the dialup details, you're almost ready to roll. You need to add user accounts to your server for it to be of any use, and in doing so you can specify whether or not they have their own account on your ISPs server.

With all of the preflight set up complete, the server sits quietly in the office happily performing the job it has to do, which is any sysadmin's dream. It really is quiet too – the unit itself isn't all that large and is cooled by vents in the casing alone. With a 2GB hard drive inside, and considering that Intel promote stacking these boxes, we're not entirely certain that's wise – your box could get very warm very quickly.

All things to all men

The server acts as a regular SMTP/POP3 server for your users, so configuring it is simply a case of pointing any mail client to the IP address of the server (or the name, if you're fortunate to have internal DNS set up) and entering the login details that you set your users up with.

As with most mail servers, you can cap the size that each individual's mailbox is set to take up, provide auto-replies and other standard mail features. Those of you who know your Linux and UNIX will know that all of this is available as standard in many of the e-mail delivery daemons freely downloadable from the net. For a non-Linux user, you may as well say "Yes you could go out and buy a car pre-built and ready to roll, or alternatively, I'll give you all of the pieces for free, and then you can find the time and knowledge necessary to build it". The beauty of the Intel E-Mail station lies in its simplicity – mail transport systems are notoriously difficult to set up and this box really is a no-brainer for your average departmental head who-just-happens-to-be-responsible-for-IT. We have doubts about its build quality – it feels very light and flimsy for a unit that is meant to be stackable sans rack, and as it also has a 'brick on a wire' power supply hanging half way down the power cable, it's not the most convenient of systems to have a number of in one place. That said, the InBusiness range has been a long time coming for the SOHO and SME businesses, and we look forward to seeing more InBusiness units in the future!

Rob Fenwick

PCPlus Verdict

INTEL INBUSINESS E-MAIL STATION

✓FOR	✗ AGAINST
➜ Easy to set up	➜ Flimsy
➜ A 'no brainer' install	➜ Brick-on-a-wire PSU

Specifications	9
Quality	7
Performance	9
Value for money	9
OVERALL	**9**

PRINTER

Lexmark Z42 Color Jetprinter

PRICE £117 **EX VAT** £100 **Supplier** Lexmark
PHONE 08704 44 00 44 **ONLINE** www.lexmark.co.uk

Lexmark's latest budget printer makes a good impression

Lexmark was once a poor relation compared to Epson and Hewlett-Packard, with its printers generally unable to match its rivals in terms of the quality of the output. But all that is now in the past and if the Z42 is anything to judge by, Lexmark will soon be able offer real competition to Epson and HP.

The Z42 is aimed at the budget end of the market. At just £100 ex VAT it is one of the cheapest printers available, but budget should in this instance not be read as cheap and nasty.

The printer takes two cartridges. I tested it with a black cartridge and with a standard colour cartridge, but a photo cartridge is also available. Loading the cartridges was quick and easy to do as was setting up the printer. I opted to install it on the USB port, although if you want to stick to using the parallel port, that option is also available. There is an easy to follow sheet showing the complete installation process that gives screen shots of each stage of the installation process. The printer then prompts you to run the calibration process to align the cartridges.

You might expect the drivers for a budget printer to be a little basic, but not so with the Z42. Here you have a number of settings that will make a real difference to the way the printer operates, including the option to install different colour profiles.

There are four resolution settings: 300 x 600dpi for draft, 600 x 600dpi in normal mode, a high quality setting of 1,200 x 1200dpi and finally the maximum setting of 2,400 x 1,200dpi. However, I found that for printing text I did not need anything more than the normal mode and when printing photos the high quality setting was perfectly adequate.

There are three basic colour settings: automatic, vivid and natural. In our tests I found the vivid useful for heightening the colour of a photo of a statue from a Bangkok temple, but it was, as you might expect, unnatural for printing photos of people or landscapes.

You can also adjust the brightness, contrast, saturation, and red, green and blue intensity on sliding dials, so letting the printer do some of the work of a photo editing package. However, for the best results you are undoubtedly better off manipulating your photos properly before printing them out.

Numerous paper types are supported, as you might expect from a modern ink-jet, and you can also instruct the printer to collate and order printing for handouts, posters and booklets.

Lexmark claims a speed of 10 pages per minute for printing text, but I didn't quite manage that. I found that a single page letter was completed in 12 seconds in normal mode, nine seconds in draft mode and 46 seconds in high quality mode. The quality of the output in normal mode was perfectly acceptable on plain photocopier paper, although I found that low quality paper did produce some feathery results.

When printing out a document 12 pages long with each page completely covered in single spaced type, it took just over three minutes for the results to appear when using normal mode, but we had to wait nineteen minutes for the final page to appear when in high quality mode. To be honest the marginal increase in quality was not worth the wait.

← It may be a budget printer but it produces good quality prints.

The printer was also quite speedy when printing off a selection of A4 photos, each with a file size over 17MB. Using glossy paper, the main test photo took just over six minutes in normal mode and a little over nine minutes in high quality mode. However switching to plain paper evened up the difference in times, with the high quality print again taking around nine and a half minutes while the normal quality print actually took a minute longer.

Quality wise the photos were good. The only banding I could see was on the plain paper prints and there was no smudging or blurring although sometimes the images were not quite as crisp as they might have been. The colours were handled well and were bright and vibrant where they should be and pale and natural in other places.

The printer did slip up on the final print, however, laying down small blocks of solid colour where none should have appeared. This marred what would otherwise have been an exceptionally good printer for the price.

Adele Dyer

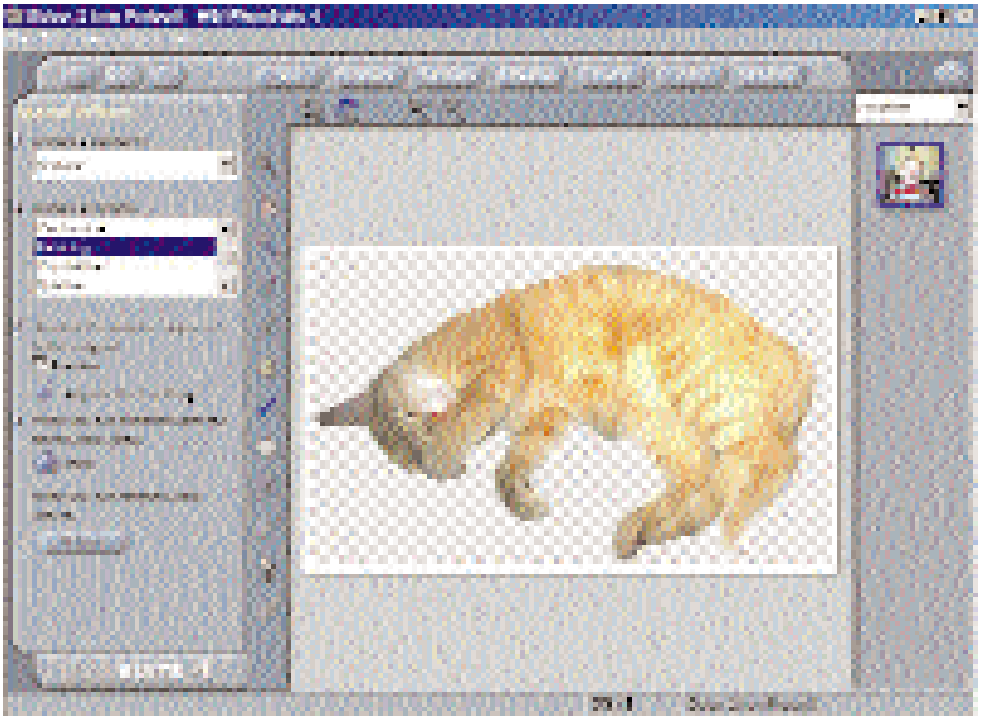
PCPlus Verdict

LEXMARK Z42 COLOR JETPRINTER

✓FOR
- → Good quality output
- → Budget price
- → Relatively fast printing

✗AGAINST
- → More expensive printers will produce better results
- → Photo images sometimes a little soft

Specifications	8
Quality	8
Value for money	9
Performance	8
OVERALL	**8**



→Provides lots of effects like this oil painting filter, and you can also use Photoshop compatible plug-ins.

PHOTO PACKAGE

MGI PhotoSuite 4

PRICE £50 **EX VAT** £43 **PUBLISHER** MGI Software
PHONE 01908 278100 **ONLINE** www.mgisoft.com

Do you have to sacrifice power in the name of user-friendliness? Find out with PhotoSuite 4

Thanks to inexpensive scanners, affordable digital cameras and integrated capture cards, photo editing is available to more and more users. The trouble is, it can be quite a challenging activity, especially to newcomers. That's why software like PhotoSuite, Picture It and Photo Impact have become so popular, with their guided approach that helps to reduce the learning curve, transforming the whole process into something which is pleasurable rather than scary.

PhotoSuite easily outsells all the other entry-level photo packages, and now the latest version has just arrived. As with any program that's designed for beginners, it's all very well releasing the first version or two, but after that, the battle is on to come up with features that are useful without compromising the program's ease of use. MGI has added a few very useful features, and refined some existing ones.

The program adopts a linear approach to photo editing, with each stage of the process quite distinctly separate from the others. While this does help to clarify the entire business of acquiring, editing and outputting photos, it also creates false barriers, and somewhat impedes the creative flow of more experienced users.

The program divides its functions into seven categories: Get, Prepare, Compose, Organise, Share, Print and Browse. Each of these is accessed via a button at the top of the screen, which takes you to a separate working area with an entirely separate screen layout and context sensitive menus and toolbars. While this approach means that you are never faced with any options that are not relevant to the current operation, it also means that you must get used to at least seven different screen layouts instead of one.

The Prepare section is the one where you'll spend the most time. It's where you go to crop, enhance and process your images. It's here that you'll find the new cutouts tool, which enables you to define transparent areas in your pictures, or to select and cut out specific portions of it. Other popular tools in this section include red eye removal, filters (which is used to apply Photoshop compatible plug-in effects), Tapestry and Stitching.

The Tapestry feature uses miniature photographs as tiles to build much larger mosaics. PhotoSuite includes two huge libraries of thumbnails for you to use, but now this version also enables you to use your own photographs.

Stitching is used to join multiple staggered photographs to create a single much larger one. One of the most popular uses for stitched images is to convert them into a 360-degree panorama, which can be viewed via your desktop or shared on the Web.

Speaking of the Web, PhotoSuite 4 now includes a number of new Web capabilities. One of the nicest is the facility to create animated GIFs. The designer is not massively sophisticated, but it does enable you to combine images and create slideshows complete with transitions very easily.

The program also includes a variety of Web publishing options. You can output your images in HTML format for browsing via your desktop, but if you specify the Web as your target, the images will be saved in optimised JPEG format for swifter downloading.

One of the problems with any creative process is coming up with ideas, but fortunately PhotoSuite 4 comes with hundreds of templates, photos, Web frames and suggestions to enable you to turn your home photos into something more attractive that you can keep or share with your friends and family.

The program does provide an undo/redo feature so that you can try things safe in the knowledge that you can go back if they don't work out as planned. However, you lose the ability to undo as soon as you exit a particular module, which is a great disadvantage.

I would have liked to see PhotoSuite provide a little more background on some of its processes so that people don't work blind to the considerations of the Internet or graphics work in general.

PhotoSuite 4 is squarely targeted at graphics novices or people who simply don't do photo editing often enough to invest the time in a more serious package. It guides you gently through every step of the way, offering help and providing inspiration.

For family users, it really puts the fun into graphics, while introducing you to some quite sophisticated topics such as transparency, cutouts and animation. It's excellent value for money.

Mat Broomfield

Requirements
Pentium 166, 32MB RAM, SVGA display, 250MB hard disk, CD-ROM, Win95 or NT 4 or higher, Internet connection for online content

Tested on
Pentium III 800, 256MB RAM, SVGA, 54GB hard disk, Win98 SE, DVD, ISDN Internet connection

PCPlus Verdict

MGI PHOTOSUITE 4

☑FOR
- →Makes photo editing extremely easy
- →Powerful retouching tools
- →Makes it fun to do more with your photos

☒AGAINST
- →Undo doesn't work across modules
- →Compartmentalises graphics editing
- →Picture database keyword entry system is awful

Specifications	6
Quality	8
Value for money	9
Performance	8
OVERALL	**8**

A welcome addition in a medium sized office but very expensive for home users.

NETWORK

Netgear FS518T Gigabit Switch

PRICE £1,174 **EX VAT** £999 **SUPPLIER** Insight UK **PHONE** 0870 700 7350 **ONLINE** www.insight.com

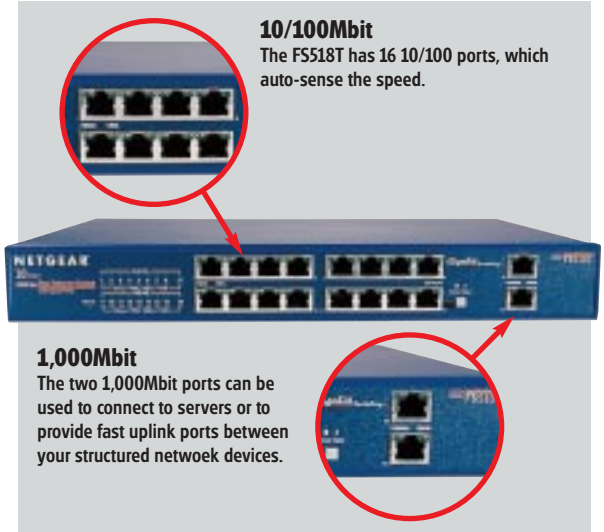
Ultra fast networking is here, are you ready to take advantage of it?

Almost any serious user with more than one machine, even just two, will have some variety of network setup. Anything from a parallel or serial connection up to a proper Ethernet network may be expected to do anything from support network printing to copying large files between machines. With any more than two machines, the cost involved in building a small ethernet network is very little, but as file sizes grow and you begin to demand more from your equipment, the little 4 port 10Mbit/sec hub doesn't quite have the kick you need anymore. 100Mbit/sec is the next step up, but if you tend to find one machine using a lot of bandwidth as a file or print server, you'll use up your 100Mbit limit fairly quickly.

Enter the Netgear FS518T 100Mbit switch with a pair of 1000Mbit uplink ports. In the past, to achieve anything approaching 1000Mbit, or gigabit, speeds you needed to invest in expensive switches and fibre based network infrastructures, but the latest offering from Netgear throws that out of the window. The 1000MBit ports on the FS518T use standard copper CAT5, all be it requiring a higher quality cable than your run of the mill networks, but chances are that if you have a relatively new installation, you'll be using CAT5e, the unofficially enhanced version of CAT5. Obviously you can save quite a bit of money if you don't need to re-run all your cables, but chances are if you can afford fibre based ethernet, cable installation isn't going to be much of a problem.

The switch is appropriate for either desktop or rack installation, although it does tend to make quite a bit of noise with all four of its cooling fans, so somewhere a little more out of the way is preferable. All of the power conversion hardware is internal to the device, avoiding any bricks on the floor or 'wall warts', making rack installations a good deal neater.

You get 16 10/100 ports on the front which auto-sense the speed, which is confirmed by a couple of LEDs either side of the little RJ45 clip, which fortunately were not obscured to any great level by the boots on the cable.



10/100Mbit
The FS518T has 16 10/100 ports, which auto-sense the speed.

1,000Mbit
The two 1,000Mbit ports can be used to connect to servers or to provide fast uplink ports between your structured netwoek devices.

One of the 10/100 ports can be used as an uplink port to another switch, hub or router, as well as the two 1000Mbit ports which you can use to connect to either your servers or to provide fast uplink ports between your structured network devices. There are also activity LEDs, as well as collision indicators for half-duplex connections, although I didn't encounter any during testing. As with almost all 100Mbit+ devices, full-duplex mode is supported on all ports, so you can, in theory, achieve 2000Mbit/sec over copper on the gigabit ports. Of course, what it's supposed to do and what it will do are very different things. A 10MBit hub probably won't achieve much more than 5 or 6Mbit, increasing to around 7Mbit if it was switched. Switched 100Mbit can achieve between 40 and 70Mbit/sec, depending on the quality of the switch, possibly a bit more with an expensive device.

While it all sounds good in theory, unfortunately it doesn't quite deliver what it is expected to. With two 100Mbit NICs connected to either the standard 10/100 ports, to the 100/1000 ports, gives a meagre 14Mbit when copying a 130Mb file between RAM discs on the two machines. All copying was performed using FTP, so large TCP packets were used and no compression was available. Most 100Mbit unswitched hubs could probably do better. With gigabit cards in both machines, it reaches around 65Mbit/sec which is perfectly reasonable for a switched 100Mbit/sec device, but not all that hot for a gigabit device. It did, however, increase to a little over 70Mbit/sec when pulling from a machine with a gigabit NIC with a pair of 100Mbit NICs. Using the 10/100 and 100/1000 uplink ports to connect to both a Cisco 803 ISDN router with a 4 port 10Mbit hub and a couple of 10Mbit devices, and to a Cisco Catalyst 2912 12port 10/100 switch, it achieved speeds of around 4Mbit and 12Mbit respectively.

Frankly, I'm not entirely sure which market they're aiming this at. Compared to a standard 10/100Mbit switch which can cost anywhere beyond £400, it doesn't seem to provide the performance features which make it a worth while investment for the home or small office user. The 1000Mbit features may be welcomed in a medium sized office, where their centralised file server is a little over used, but in that circumstance, a Cisco or SMC switch with fibre ports is a far more worth while investment. Add to that the lack of any management or configuration abilities of the FT518T and it's not a great deal of use in a bandwidth hungry business environment.

Dave Coulson

PCPlus Verdict

NETGEAR FS518T GIGABIT SWITCH

✓FOR	✗AGAINST
→ Vistanetwork port LEDs	→ Performance
→ Integrated PSU	→ Noisy
	→ Price

Specifications	9
Quality	8
Performance	6
Value for money	6
OVERALL	**7**

DVD-RAM DRIVE

Panasonic LF-D201E

PRICE£375 **EX VAT** £319 **SUPPLIER** 0845 600 3535
PHONE Panasonic **ONLINE** www.panasonic-storage.com

Mass storage for the PC, but its compatible media may cause problems

Panasonic has doubled their DVD-RAMs media capacity to 9.4 GB per disk and released two supporting drives. On the home front, DMR-E10 DVD Recorder includes an MPEG-2 encoder. The LF-D201E, aimed at the PC market, is a less glamorous offering.

Installation is straight-forward, with all the cables, screws and jumpers included. A bank of jumpers on the back of the drive is the only thing you'll have to configure – this controls SCSI ID and termination. Software installation is just as simple and once finished two rather unnecessary and unintuitive drive icons are created. The first is used for accessing removable media and the second for CD and DVD-ROMs.

On the software front Panasonic seems overly generous, with seven new items created on the Start Menu. All of these applications are in fact tiny utilities designed to achieve such mundane tasks as disc copying, formatting and backing up – thankfully most of them are accessible as Explorer extensions. The included MPEG-1 Coder and the MPEG-1 Mixer are designed to help you stream your films straight on to the drive in real-time, but as they're basic and a little unreliable in operation, you're better off using a more professional package.

Requirements
Win95/98, Win NT 4.0, SCSI Adaptor
Tested on
Pentium III 500, Adaptec controller
Extras
Media prices £35for 9.4GB media, £23 for 4.7GB media

← **Panasonic LF-D201E DVD-RAM drive, released with 9.4 GB on a single disk and double the capacity of their previous model**

4.7GB cartridge

One piece of media is supplied with the drive, a single-sided 4.7GB cartridge. This took less than 20 seconds to format as UDF 1.5 (a FAT-32 format hit the 4GB limit), after which you can start accessing the 4.26GB of space. Transfer rates are fairly impressive at 1.18MB/s, taking less than half-an-hour for a 2GB backup.

Removing the disc from the cartridge presents you with a DVD that should be readable in other drives, but nominal format differences prevent this.

Apart from the new 4.7GB per side cartridges, the LF-D201 supports the original 2.6GB and 5.2GB discs. DVD-Video is of course supported, although region code dependant, you are given 4 chances to change it using the DVDRgn utility.

The rival DVD-R format is supported if created using the Disk-at-Once mode and finally, CD-R and CD-RW discs can also be read, making this drive impressively compatible.

However, it's a shame that the same cannot be said for the media created in it.

Alan Dexter

PCPlus Verdict

PANASONIC LF-D201E

☑FOR	☒AGAINST
→ High capacity	→ Incompatible media
→ Fast, compatible drive	→ Weak MPEG-1 software
→ Mostly decent utilities	

Specification.....8
Quality.....7
Value for money.....8
Performance.....8
OVERALL.....8

PRINTER

Hewlett-Packard Deskjet 990 Cxi

PRICE £250 **EX VAT** £213 **SUPPLIER** HP
PHONE 08705 474747 **ONLINE** www.hp.com

A classy printer from Hewlett-Packard with double sided printing and infra-red

Hewlett-Packard has been busy again. It's come up with the new Deskjet 990 Cxi, a printer that forms part of its Professional Series. This ink-jet printer is aimed at the high end home user or small office professionals and it shows in the neat design that is reminiscent of other large footprint HP deskjet models.

I thought it looked rather like the DeskJet 930C which was reviewed in the ink-jet round-up in **PCPlus** issue 165 but that is where the similarities end. This updated model includes features such as double sided printing and an infra-red port which enables you to print from PDAs and notebooks.

Setting up the printer is easy; it can be used via a USB or parallel connection to your computer. Also at the rear there's a paper jam tray that enables you to remove the back of the printer in the rare event of a paper jam. Installing the printer cartridges is a piece of cake: lift the lid and the print head goes to the middle of the printer. From here, you can easily add or remove colour and black ink cartridges.

Requirements
IBM PIII 500, 128MB, 13.6GB hard drive, Win98SE

← **The Hewlett-Packard Deskjet 990 Cxi provides professional quality prints at high speed**

Expert design

Hewlett-Packard has loads of expertise in printers which is utilised fully in the design of this printer. This shows in facilities such as decent paper handling capabilities – this printer can handle 150 sheets of A4, 45 cards and 20 banners, as well as the usual labels on A4 sized paper. If it all goes wrong, there's a print cancel button, something that you won't find on more expensive printer models from other makes. The printer and its driver software is simple to use so you won't really need the great reference manual that comes as standard, although it is very useful.

The print quality is pretty good thanks to HP's proprietary printing technology PhotoREt II, an enhanced colour layering technology which produces richer tones. Print speed is faster than many other ink-jet printers producing black and white prints at 17ppm and 13ppm in colour.

The Hewlett-Packard Deskjet 990 Cxi is packed with features which makes it quite expensive. But, if you can live without some of the features it provides, such as the infra-red port, there are cheaper options available.

Tony Browne

PCPlus Verdict

HEWLETT PACKARD DESKJET 990 CXI

☑FOR	☒AGAINST
→ Good printing performance	→ Price
→ Infra-red port	

Specifications.....8
Quality.....8
Value for money.....7
Performance.....8
OVERALL.....8

HANDHELD COMPUTER

PSION REVO PLUS

PRICE £299 **EX. VAT** £255 **SUPPLIER** Psion
PHONE 0870 101 0500 **WWW** www.psion.com

Psion's Revo Plus adds Web browsing and WAP capability to the stylish mini handheld.

The Revo Plus looks very much like the standard Revo. The styling of the case is exactly the same, with the dark, almost black, purple replaced by a slate grey colouring. Open the Revo Plus and it looks just like the Revo, though a telltale 16MB marker denotes that this new machine has double the memory of the older one. There are many similarities between the Revo and Revo Plus, and I will return to this point later, but it is the differences that Psion are obviously most keen to accent.

These amount to the inclusion of a Web browser and a WAP browser which can be installed from CD. Both are the key clues to Psion's market for this device which they are calling their 'mobile Internet organiser'. Psion will retain the existing Revo in their suite of handhelds, with the Revo Plus becoming the tool for those of us that need to be connected.

It is worth noting early on, though, that you will need to provide a modem as there are none on board. This could be either an external landline or GSM device such as Psion Connect's 56k infra red modem, or a modem incorporated into your mobile phone.

Specifications
ARM 710T Processor 36MHz, 16Mb RAM, Psion EPOC operating system release ER5, infra red, docking station. EPOC applications – Contacts, Agenda, E-mail, Phone, Time, Calc, Jotter, Data, Word, Sheet, WAP, Opera, Cascade (game). Supplied with docking station, mains power supply, PsiWin PC connectivity software.

The WAP browser has been developed for Psion by Purple Software, and it could be quite a boon to a dedicated WAP user. Its display is far larger than that on any current mobile phone, particularly if you turn off the toolbar, title bar and other extras and just view the WAP content. Alternatively, you can have a folders list on screen to see bookmarks and history. At the same time as the Revo Plus was launched, Psion announced their own WAP portal. Developed by Trivanti, a company they set up with United News and Media, this offers information on news, sport, weather, finance and entertainment provided by respected third parties.

If you would rather use your existing WAP portal, you can configure this as a separate 'profile'. Creating profiles and switching between them is straightforward enough to do, but it is annoying that the only help is on the handheld itself - there is none in the printed manual for either the WAP or Web browsers.

When it comes to the Web, Psion has ditched its own browser in favour of Opera, an independently produced tool which also exists in a well received PC version. Opera has features like the ability to turn off image retrieval for quick downloading, and supports Java applets and HTML 3.2. But the key elements of Opera, as far as Psion is concerned, are its support for 128-bit SSL 2 and 3 encryption and TLS 1.0 secure transactions. With these features users can access corporate intranets to retrieve data and update schedules, do electronic banking and access other secure web sites, and make purchases from wherever they happen to be. Incidentally, Psion says that access to Opera will be extended to owners of its other handhelds "in due course".

Apart from the Web and WAP browsers, and the slightly different hardware colouring, the Revo and Revo Plus are almost impossible to differentiate. Both have the same display technology, and both lack a backlight. The operating system is still EPOC Release 5, and the software suite remains unchanged. Even the icons for the new Web and WAP browsers on the Revo Plus are on the extras bar rather than on the main icon strip: Psion has clearly not re-engineered the hardware at all. The processor remains the same as that used in the Revo, PC Connectivity is still serial (though Psion says USB is on the way), and PsiWIn 2.3 still does the job of translating data between the handheld and your PC.

←With a WAP browser and a Web browser, Revo Plus is being marketed as the mobile internet organizer.

Psion has a strong operating system and software suite, and arguably there is no need for them to make wholesale alterations. But there is always room for a little improvement and a few minor tweaks would have been good to see. PsiWin certainly needs an overhaul, and this would have been the ideal opportunity to release a more robust version. Instead we will have to wait until later in the year. On the hardware front, we would have particularly liked a backlight, the inclusion of a modem, and CF expansion, though the latter in particular would have required considerable redesign of the casing.

In the end, Revo Plus is another very good product from Psion, whose Internet connectivity should ensure its success. But we do feel that Psion has missed an opportunity in failing to incorporate just a few new software and hardware features.

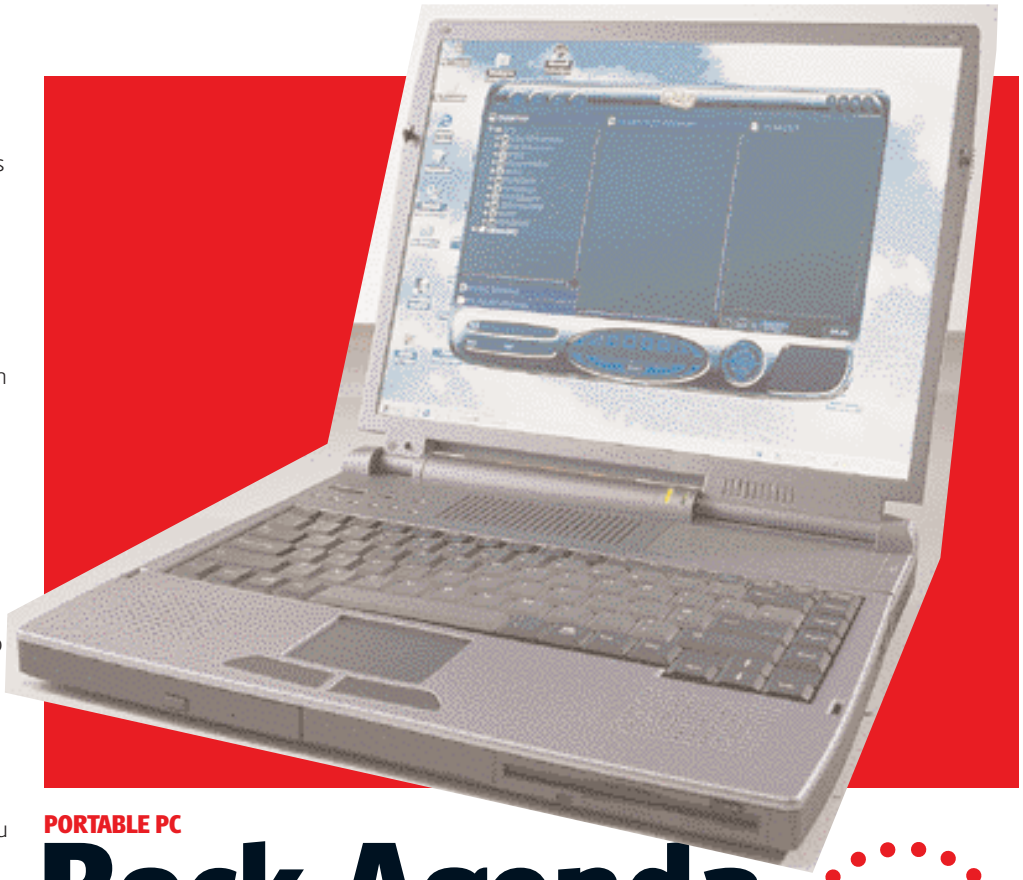
Sandra Vogel

PCPlus Verdict

PSION REVO PLUS

✓FOR	✗AGAINST
→ Retains strong styling of Revo	→ Not expandable
→ WAP browser particularly strong	→ No backlight
→ Ultimately pocketable	→ PC connection serial rather than USB

Specifications	8
Quality	9
Value for Money	9
Performance	8
OVERALL	**8**



PORTABLE PC

Rock Agenda XT 700

PRICE £1,996 **EX VAT** £1,699 **SUPPLIER** Rock
PHONE 08707 292252 **WWW** www.rock-computers.co.uk

The Agenda XT 700 has an ultra fast processor, DVD drive and large display, and comes with two power cables and its own carrying case

Rock's latest Agenda portable computer has been positioned as a desktop replacement machine. This is a quite reasonable thing to do from a marketing point of view. Portables are smaller than desktop computers and so easy to hide away when they are not in use.

As far as components go, there could be issues if you want to use your computer for gaming, which requires both a fast graphics card and a very large display, for music making, where again specialist hardware is required, or for some other specialist task. But, for those who use their computer primarily for productivity, the idea of a portable instead of a hulking great desktop is a sound one and there is no reason why a portable should not suffice.

The Agenda XT 700 meets its desktop replacement requirements in several ways. The processor is an ultra fast Pentium III running at 700MHz: you can go for a 750MHz version of the chip if you need the extra oomph.

→Rock's Agenda XT 700 is a solid portable with a very large display.

The display is an impressive 15.1 inches on the diagonal, a size still rare enough to impress and with the capability to show two working windows side by side, which many portable displays are just too small to manage. There is an S-video socket and a monitor connector if you really do need to send the display to something larger.

The hard drive is a reasonably generous 12GB – it should be enough for most needs and there is an internal modem, so getting onto the Internet should not be a problem. A LAN connector is present in case you need to get onto a network at any time, USB and PC card sockets are also provided for expansion along with serial and parallel interfaces.

The build is generally tough, and the lid is made from magnesium alloy which provides plenty of protection for the display. The keyboard is solid and full sized, and worked perfectly well on test along with the touchpad. If you do ever want to carry the Agenda around, it is no featherweight at 3Kg. It is a fair old size at 325mm wide x 270mm deep and 30mm high – it has to be large to accommodate that enormous display. But the good news is that it comes with its own carrying case.

Performance under our benchmark tests were good, with the Agenda producing a rating of 1.2. I don't anticipate that you will spend some time waiting for the machine to catch up with whatever you are doing.

But while it has many strong features, the Agenda XT is not entirely a panacea. The main problem is poor battery life. On test I only got an hour and 45 minutes from it. Now, if you intend to use the Agenda XT as Rock expects, that is.

Specifications
Intel Pentium III 700MHz, 128MB RAM, 12GB hard drive, 15.1-inch display, 1,024 x 768 x 16-bit, PCMCIA 1 x Type II, USB x 1, internal 56K modem, LAN adaptor, s-video port, DVD drive, 1.44Mb floppy
Operating System
Win98 SE

plugged into the mains, this is unlikely to be an issue. Indeed, they even supply two power cables so you can travel with the Agenda between two locations without having to carry the mains adaptor. But if you ever find yourself wanting to use the machine on the move, an hour and 40 may well not be enough time for you to do the work you need.

A further issue is the fact that the floppy and DVD drives are in fixed rather than modular bays. This means that you cannot replace the DVD or floppy with additional devices such as a CD-RW drive or high capacity floppy drive. This issue simply does not arise on a desktop computer where there are usually free bays for you to add extra devices. True, you are able to add CD writers and so on to the Agenda as peripherals, but the more extras you add to the comouter with wires, the less likely you are to actually put the portable away when it is not in use.

For £2,000 you could buy a real wowser of a desktop computer with plenty of added extras to go with it. A portable can be a fair bit more expensive than a desktop machine and so a desktop replacement portable needs to convince buyers that it offers more to justify the higher price. That means portability still counts, and this is where Rock falls down, because of its low battery life.

This notwithstanding, the Agenda XT 700 is a well built computer which performs well. It should function well as a desktop replacement – provided you are sure you'll never want to take it on the road.

Sandra Vogel

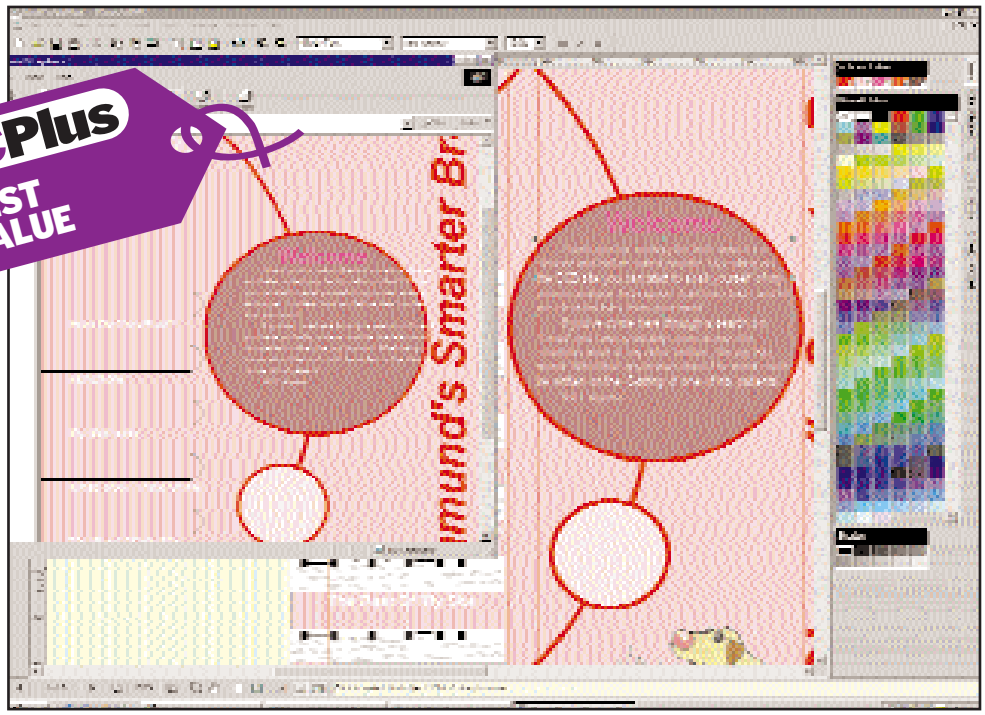
PCPlus Verdict

ROCK AGENDA XT 700

✓FOR
- → Solid build
- → Good performance
- → Stunning display

✗AGAINST
- → Poor battery life
- → Fixed rather than modular drives

Specifications	8
Quality	9
Performance	8
Value for money	7
OVERALL	**8**



WEB DESIGN

Serif WebPlus 6.0

PRICE £30 **EX VAT** £25 **SUPPLIER** Serif **PHONE** 0800 376 7070
ONLINE www.serif.com

Web-sites will benefit from the design and animation facilities of WebPlus 6

WebPlus 6 isn't just a stripped down version of Serif's successful PagePlus DTP program, but the two programs do have a lot in common. The installation of both is as easy and WebPlus looks superficially very similar to the uncluttered interface of its bigger sibling.

Like Page Plus, WebPlus is keen for you to start with a Wizard. While it's possible to design from scratch, the program offers a good range of standard designs and these aren't just for a single pages – most are for sites of six or eight pages and you can add more, of course. Entering your details into the Wizard saves quite a bit of fiddling and the use of colour schemes – sets of toning designer colours – makes colour matching easy. There are associated tints for each colour in a scheme, too, so you can adapt the originals without introducing gaudy clashes.

PagePlus' palettes, down the right-hand side of the screen, are preserved in WebPlus, so you have an easy way at getting at essentials like font information, line attributes and the portfolio. This is like an extended clipboard, where you can copy page elements by simple drag and drop to reuse them in other places, or in other documents.

Requirements
486 PC, 16-64MB memory (depending on Windows version), 30MB HD space, SVGA graphics card, CD drive, phone line
Tested on
Athlon 750, 64MB memory, nVidia Riva TNT2
Extra information
Comes with free access to VisualCities, who will host Web sites created with WebPlus.

In the raw

The toolbox on the left-hand side of the screen has some Web-specific extras, like animated GIFs, marquees, sounds and video. These can all be inserted onto a page in the same way as pictures, text or logos. Raw HTML and JavaScript can also be added, though you won't see the results until you preview.

One thing missing from the extra tools is an easy way of adding rollover buttons to your page. It's surprising WebPlus should give them so little emphasis. While there's a set of button graphics among the 20,000 Web art images, they're not animated, so nothing happens when you run your mouse pointer over them, and there's no hyperlink associated with each one automatically.

Buttons and menu selections are catered for with hotspots, and WebPlus has a tool for creating rectangular ones, which you can then manipulate by adding extra nodes and stretching them around. This is versatile, but I'd still like the buttons, too.

Extra dialogs for hyperlinks, Web pictures and resources show what you've used in your site. A layout checker looks for text problems and for items which will increase download times. One or two of Serif's own templates don't do too well in this utility.

LogoPlus is included in WebPlus 6, so you can add some interesting, if over-flashy, designs to your pages. Even more useful is TablePlus, which caters for most of the tabular information that you may wish to present.

No, the text goes here

As is traditional with Serif applications, there are a few rough edges. Most of these have to do with the What-You-See-Is-What-You-Get-ness of the pages you design. While it's useful to be able to include segments of raw HTML code on your page, it would be more useful to see the result of the code within WebPlus, rather than to have a box saying simply HTML. The same goes for animated GIFs – there should be a facility to check the animations in situ, without having to preview the page in a browser. While I'm talking about previewing and WYSIWYG, a few more warnings of limitations would be handy. For example, what's the point of WebPlus offering hundreds of fonts for use on your pages without a warning of the small number which are recommended styles on the Web? The layout checker does produce a warning on this, but for the beginner, an extra pop-up would be a useful addition.

← Compare the layout of the white text in the dark circle in WebPlus and the same viewed in IE4 on the left.

I added an Arial Narrow text box to a sample page in the editor, but when I loaded the page into the browser, Arial was substituted and all the line lengths changed. This didn't account for the changed position of the left margin, though. It's difficult to work efficiently if you can't rely on the positional accuracy of the software.

Serif provides free Web space for the sites you create with WebPlus on the VisualCities domain, which is a useful bonus.

All in all WebPlus 6.0 is most of the way to being a really useful Web design tool at an exceptional price. It's just one or two annoying shortcomings which stop it reaching its goal.

Simon Williams

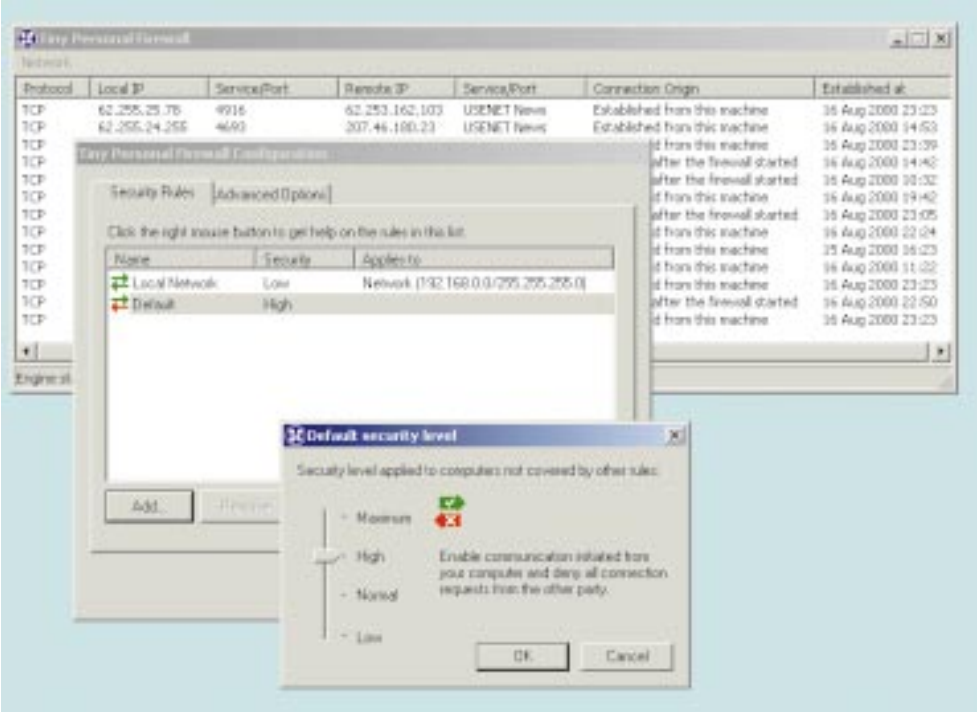
PCPlus Verdict

SERIF WEBPLUS 6.0

☑FOR
- → Masses of design ideas
- →Useful tools for adding raw HTML and Java
- →Layout checker helps produce clean sites

☒AGAINST
- → No animated buttons
- →Some layout idiosyncrasies
- →HTML, Java and GIFs only show in preview

Specifications	7
Quality	8
Performance	7
Value for money	10
OVERALL	**8**



Despite British Telecom's sterling efforts to keep its cash cow in clover for as long as possible, nobody doubts that everyone in the UK will be enjoying unmetered Internet access within the next few years. Moreover, as broadband technologies like cable modems and ADSL become increasingly widespread and affordable, people will expect the convenience of an 'always on' high-speed connection to the Web. Unfortunately, this presents a prime opportunity for hackers who use sophisticated port-scanning tools to find unguarded access points into vulnerable PC's, with possibly disastrous consequences.

→Tiny Personal Firewall enables you to set up one or more rules which control access to your PC. You can set up a rule for your local intranet, additional rules that control access from specific IP addresses and a default rule that controls everything else.

I'm a keen user of NTLWorld, the unmetered Internet access service which was launched by NTL some months ago. Since this service has been available, I've discovered (and others have found the same) that NTLWorld subscribers are prone to having their PC ports probed on a frequent basis. Why? Because a bank of IP addresses belonging to an unmetered service are far more likely to be port-scanned than others; hackers aren't dummies and they'll naturally scan where there's most likely to be something there!

There are various firewall applications on the market which offer protection against unwanted visitors, for example ZoneAlarm. However, I've not always been able to get ZoneAlarm to work reliably under Windows 2000 and the program is undeniably quite large. If you want a simple, reliable solution that you can virtually set and forget, then look no further than Tiny Personal Firewall from Tiny Software Inc. This is well named, the main executable is 152KB in size and that's pretty much the whole thing!

The best way to use Tiny Personal Firewall is to include it in your Startup folder so that it starts running automatically whenever you boot into Windows. The main configuration window enables you to easily set up one or more 'security rules' which are applied whenever another machine attempts to communicate with your PC. There's a rule for machines on your local network, and there's another rule which controls access from the Internet. That's probably all you need, but you can also add additional rules which block access from specific IP addresses if you want this level of control.

For each existing rule, you can set its security rating to Low, Normal, High and Maximum. The Low setting allows all traffic, though Tiny Personal Firewall does log what's going on. If you've got the Normal option set, then any attempted port scan will cause a dialog box to appear, notifying you of the IP address which is trying to probe you and the port that's being probed. This dialog gives you the option of responding to the request or ignoring it. The High setting will simply ignore any port probes whereas the Maximum setting disables all communication with the machines in question. You'll typically want to use the Normal or High settings; if you don't get many port scans then it's interesting to see when port scans take place, but if you get a lot of probes then the High setting will enable you to effectively ignore all port probes.

I tested Tiny Personal Firewall by connecting to Steve Gibson's well-known port probing Web site at www.grc.com. With security set to Normal, I was bombarded by a series of dialog boxes telling me that I was being port probed. Accepting or denying each request gave me fine control over what Steve's Web site was able to discover. I then repeated the exercise with security set to High. This time round, I got no warning dialogs and Steve's site wasn't able to determine anything about my PC – in fact, it couldn't even see it and referred to this as Stealth mode. Using the high security setting not only enables you to work without interruption when you're being port scanned, but it also wastes time for the hacker because he has to wait up to a minute for a response to be returned before deciding whether or not a port exists at that address.

I found Tiny Personal Firewall to be a great no-frills, no-nonsense utility that does exactly what it says. My only minor gripe came about when using the High setting of the default security rule which always drops back to Normal after rebooting.

Dave Jewell

FIREWALL

Tiny Personal Firewall v 1.0

PRICE $29 **SUPPLIER** Tiny Software Inc **PHONE** 1-408-919-7360 **ONLINE** www.tinysoftware.com
E-MAIL sales@tinysoftware.com

A no-nonsense personal firewall that lives up to its name (it's seriously tiny!) and effectively protects your PC from prying eyes

Requirements
Win95/98/NT4/2000, Pentium II, 4MB RAM, 250KB disk space
Tested on Windows 2000, 500MHz Intel, 256MB RAM.

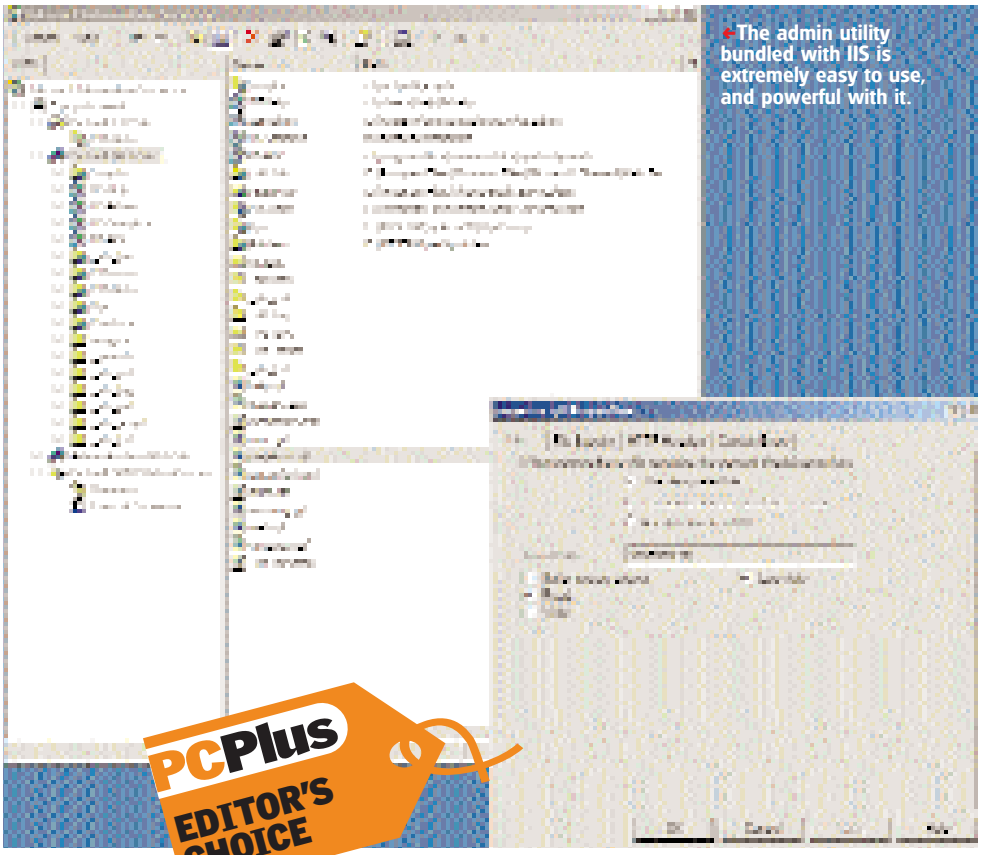
PCPlus Verdict

TINY PERSONAL FIREWALL V 1.0

✓FOR
- → Inexpensive
- → Reliable
- → Easy to use
- → Prevents unwelcome visitors to your PC

✗AGAINST
- → Doesn't remember the 'High' setting of security rules after a restart

Specifications	8
Quality	8
Value for money	9
Performance	8
OVERALL	**8**



The admin utility bundled with IIS is extremely easy to use, and powerful with it.

SERVER

Windows 2000 Advanced Server

PRICE £1,321 **EX VAT** £1,125 **SUPPLIER** Microsoft
PHONE 0870 60 10 100 **ONLINE** www.microsoft.com

The flagship product of Microsoft's Server OS options, can Windows 2000 handle the wild attacks of Rob Fenwick?

System administrators are cautious beasts. Living by a rule of "If it aint broke..." coaxing a sysadmin in to an upgrade can often be something of a chore. On the other hand, the adventurous (probably youthful) innocent 'install everything in sight' fanatic admin will leap at any new OS offering from the mighty Redmond.

So which should you be? We're going to take a look at Windows 2000 Advanced Server in relation to its predecessor, NT 4. When you first install Windows 2000, it's very obvious that NT has had something of an overhaul. The installer is much more sleek, but considerably slower. Having an installer on Advanced Server that is virtually identical to 2000 Professional seems odd, and is slightly limiting – for example, during the networking setup stage, the installer will set your server up to use DHCP by default, unless you tell it otherwise. I can't think of any reason why I would want a server to have a Dynamic IP.

That aside, when you first run Advanced Server, a 'Configure your server' wizard appears – from here you can configure Active Directory services, Web services, clustering and so on. Wizards and guides and little graphical paper clips (thank goodness Clippy hasn't made it to server admin just yet) aren't really what your average System Admin is used to – and they'll either love them or hate them. Certainly, the wizards do a reasonable job of setting a server up, but you'll need to manually get in there and tweak the settings to really batten down the hatches.

Tweak me

Server configuration is handled by a number of management consoles in a new control panel, making previously tedious setup work extremely accessible. As this is the WebMaster section, we will focus on two key areas of the Advanced Server: Internet Information Services (IIS), and Windows Media Services (WMS). IIS should be familiar to you as the combination of Microsoft's Web server, FTP server, and SMTP services. Windows Media Services are new to default Windows installations, with 2000.

IIS administration has had something of a facelift – the new IIS management console integrates all of the IIS admin functions in to one powerful interface, and it really is powerful. You can set properties and behaviours at three different levels.

At the top level site properties you speciy log formats, tune performance settings, install and manage various extensions, create custom HTTP headers and manage other global configuration issues. You can create custom error code pages, and add site operators who can update and maintain site settings. Most global settings can be overridden at folder or file level, as with the Apache/UNIX way of working – unlike Apache, however, their doesn't seem to be a way to stop global settings being overridden further down the line. That's not too much of a problem, as these settings can only be configured through the management console, and not by users – there is no Windows 2000 equivalent of the '.htaccess' file.

Folder and file options allow you to set up redirects, modify permissions etc. You can also set up 'content expiration' to manage documents that only need to exist on your servers for a specific period of time.

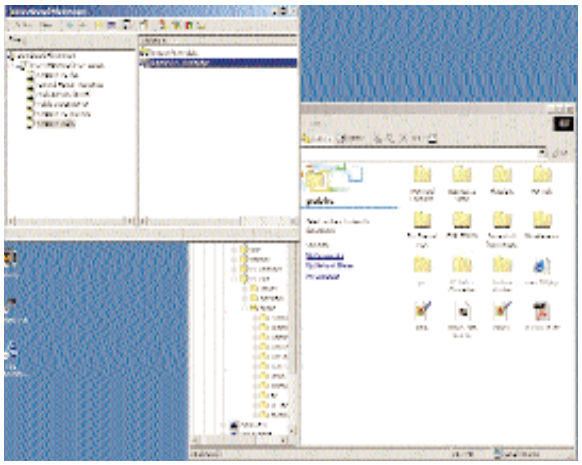
Mini-Me

The word 'replication' is enough to turn any sysadmin's blood cold. What is it, and how does it affect you?

Replication is a term used to describe the synchronisation of content on two or more servers. A user could upload a page to one server, which is then 'replicated' to the other servers in your farm at a preset time. More often than not, this is achieved by nothing more technical than rsync or even xcopy – as there's been no real clustering support in NT before.

All of that changes with Windows 2000, which incorporates full clustering capabilities in to the latest version. If you're not familiar with the concept of a server 'cluster' – put simply, it essentially transforms many servers in to one 'sudo-server' – when someone hits www.pcplus.co.uk, for example, they hit the cluster controller server, which then passes the connection to a web server in our farm that isn't too busy. If one of the web servers goes down, then the cluster controller pages the Web admin team, and stops trying to pass connections to it until it comes up again. If the cluster controller goes down, within 120 seconds, a backup cluster controller will take the IP address of the main controller, and take over.

Twice a day, we mirror the contents of our servers in Bath with Server 1 in London. The contents of London 1 are then replicated across the cluster, so you always see the latest content. We clustered three boxen on a small network, and then purposefully dropped the cluster controller – after 32 seconds, the server farm started responding to requests once more.



↑ The distributed File System is a powerful new feature when coupled with replication.

Flaming FTP

Windows 2000's FTP service has incorporated many of the features available in popular UNIX servers such as wu-ftpd. You can now set up access rules – for example, by default DENY access to the FTP server, EXCEPT for machines with ip $xyz. You can set up server operators who have full access to maintain your server, but as ever all authorised logins will require a user account on your server, or more likely, PDC.

By default, all anonymous logins to your server are handled by a generic user account called IUSR_SERVERNAME so you can set the permissions on that user to control your anonymous connections. The IIS Management console will allow you to cap connections to the server at a specific level, set timeout limits, and also specify welcome/quit messages. The FTP service for Windows 2000 is still pretty limited when put alongside its UNIX counterparts – perhaps most notable is the absence of the ability to set connection limits and timeouts by 'class' or user group.

IIS has included SMTP services in the past, but this latest version includes the ability to set up complete SMTP Virtual servers, with access rules, filtering and so on. It's all easily configurable, as you disappear in to Wizard overload in this section. You can also set connection and file size limits to your SMTP service, which is essential to running a mail server on any corporate intranet.

Elsewhere in the OS

IIS is, of course, not the only part of Windows 2000 Advanced Server by a long stretch – setting up a DHCP server, for assigning IP addresses to the workstations on your network 'on the fly' couldn't be easier. Terminal Services have been expanded, so that (if you have the money for license) you really can create a complete thin-client architecture on which to base your network. The Remote Storage manager will move infrequently used files off your busy server spaces, on to other media such as a remote hard drive, or tape device.

There are new, extensive, options for setting local security on the server – no more hacking around with your Primary Domain Controller's registry to prevent local logins! Perhaps one of the most exciting developments in the Distributed File System, part of the new Active Directory services. Using the DFS, you can link together shares from all over your network in to one shared folder, and then monitor the status of each of the shares. Imagine that every workstation on your network has a share containing a piece of auditing software. You could set up a new DFS root on your server, and add each of the audit shares to the DFS tree. Your administrator could then browse the audit share of each of the workstations in turn – and the server can monitor the availability of each of the shares.

Similarly, you might have a project team set up all working on different areas of one project – you could create a project share on your server, and then the nodes of the DFS tree could each be a specific part or team on your project. This is quite similar to Novell's NDS.

Catch up

All in all, Microsoft have been left playing catch up with this latest release of Windows, but they really have caught up, and Windows 2000 Advanced Server is an extremely powerful server system with clustering, DNS, IIS, DFS, WINS, DHCP, and all manner of bizarre acronyms ready to roll out of the box. It's still priced out of the range of many SOHO users, but for corporate computing this is a real contender.

Rob Fenwick

PCPlus Verdict

WINDOWS 2000 ADVANCED SERVER

✓FOR	✗AGAINST
→ Powerful new features	→ Price
→ A vast improvement over NT 4	→ 'Catch-up' release

Specifications	10
Quality	10
Performance	10
Value for money	9
OVERALL	**10**

→ Windows Media Services

Windows Media Player can read content from this server but can you create it?

If the Web evangelists are to be believed, streaming media is the next 'big thing' on the Net, and if that's true then all Web administrators have a major decision to make. When it comes to streaming media, really you have a choice of two big camps. RealNetworks produce RealServer, which streams media to the RealPlayer client software. Microsoft has Windows Media Services, which stream files to the Windows Media Player.

If you currently host your sites on UNIX servers, then the decision has been made for you – there are no WMS versions for UNIX, if you're on Windows then it's worth nothing that while WMS is included as part of the Advanced Server package, Microsoft are still playing 'catch up' in this field, where RealNetworks are definitely the leaders. Like RealServer, WMS has a Web admin interface. Like RealServer, you can cap connections and control server load through various connection points. Like RealServer, you get a real-time monitoring applet for keeping an eye on your system.

WMS uses Microsoft's audio file format 'Advanced Streaming Format' (.asf) – but the Windows Media Tools required for creating files of this type are not included in the box. Given the cost of Windows 2000 Advanced server, this is really quite remarkable.

The WMS Services are well and extensively documented by Microsoft, and it's real techie documentation too, which fits the Media Services lack of wizards, wizards, and more wizards!

↑ If you have the money to buy the Windows Media Tools to produce ASF files, then you will find WIndows Media Services to be very useful for serving Windows clients.

SOFTWARE DEVELOPMENT/WEB TOOLS

'Indy' Internet Components, aka WinShoes 8.0

PRICE Free of charge **SUPPLIER** Chad Z Hower and The Indy Pit Crew
ONLINE www.nevrona.com/Indy **E-MAIL** mailto:chad-jm@Hower.org

WinShoes loses its silly name, goes cross-platform, and acquires a host of other new features including support for SSL

If you've been following C++ **Masterclass** in recent times, you'll know all about the well-respected WinShoes toolkit, a set of freeware Internet components for Delphi and C++ Builder. What you might not know is that this component set has been largely rewritten in the last few months, and has now been renamed 'Indy', short for Internet Direct. Name changes aside, the really big news here is that Indy has been altered to remove as many of the Windows API dependencies as possible, making it into a cross-platform set of components.

Indy will be bundled with Delphi 6.0 and C++ Builder 6.0, the next versions of Borland's popular RAD-based development systems, and will also be included with Kylix, the Linux port of Delphi that's expected around the end of this year, or early 2001. The bottom line is that if you write your next great Web application using Delphi and Indy, you should have relatively few problems in porting your program to Linux once Kylix becomes available.

Requirements
Windows 95/98/NT 4.0, Pentium II, 16MB RAM, 7MB disk space
Tested on
Windows 2000, 500 MHz Intel, 256 MBytes RAM.

Strictly speaking, Indy is still in beta and **PC Plus** generally doesn't review beta products. However, Open Source team-based projects are a somewhat different animal, often remaining in beta for an indeterminate time as they're incrementally updated and refined. What's certain is that you can start working with Indy now, incorporating it into your own applications, whether freeware or commercial. Moreover, the Indy development team, somewhat colourfully called 'The Indy Pit Crew' have stated that Indy is now substantially complete and most of the remaining work is on documentation issues.

We've looked at several Internet component libraries, often costing hundreds of pounds, and the amazing thing about Indy is that it's just as good, if not better, than the commercial offerings. There are several reasons for this. Indy offers a very wide range of drop in tools; not just your average FTP, POP3 and SMTP components, but it also has high-end features such as support for SSL (Secure Sockets Layer) making it possible to build secure e-commerce applications. On top of that Indy contains not just client-side components but server tools as well. Thus, you get source code for a basic FTP server, newsgroup server, time server and so on. You'll also find code for implementing TCP tunnels, which can be used as a basis for creating VPN (Virtual Private Network) applications. Heck, even the new Indy icons on the component palette are real works of art!

←As you can see from this HTTP demo, pretty much the only thing missing from Indy is a HTML parser/viewer. However, such things are available as third part components – for example,. try www.pbear.com.

Indy isn't source code compatible with WinSock (all the class names have been changed as part of the rewrite) but we're assured that once you've updated your component class names, code changes will be minimal.

Like its predecessor, Indy uses a blocking model which basically means that when initiating a lengthy procedure, the calling thread is halted. This isn't a problem provided that you structure your program in such a way as to perform time-consuming activities using a background thread. That way, foreground responsiveness isn't effected.

The beta 2 release of Indy will automatically install into your favourite IDE. A large number of sample programs are included, and the ones that we tried worked first time. We were especially impressed with the speed of the various applications such as the sample newsgroup reader. There's only one fly in the ointment, and that's the lack of online help. The current Indy help file could best be described as minimalist, and that's being as charitable as possible.

However, as mentioned above, most of the Indy team are now devoting themselves to turning out a decent set of documentation. Once complete, vendors of highly priced, commercial toolkits will have every reason to be worried.

Dave Jewell

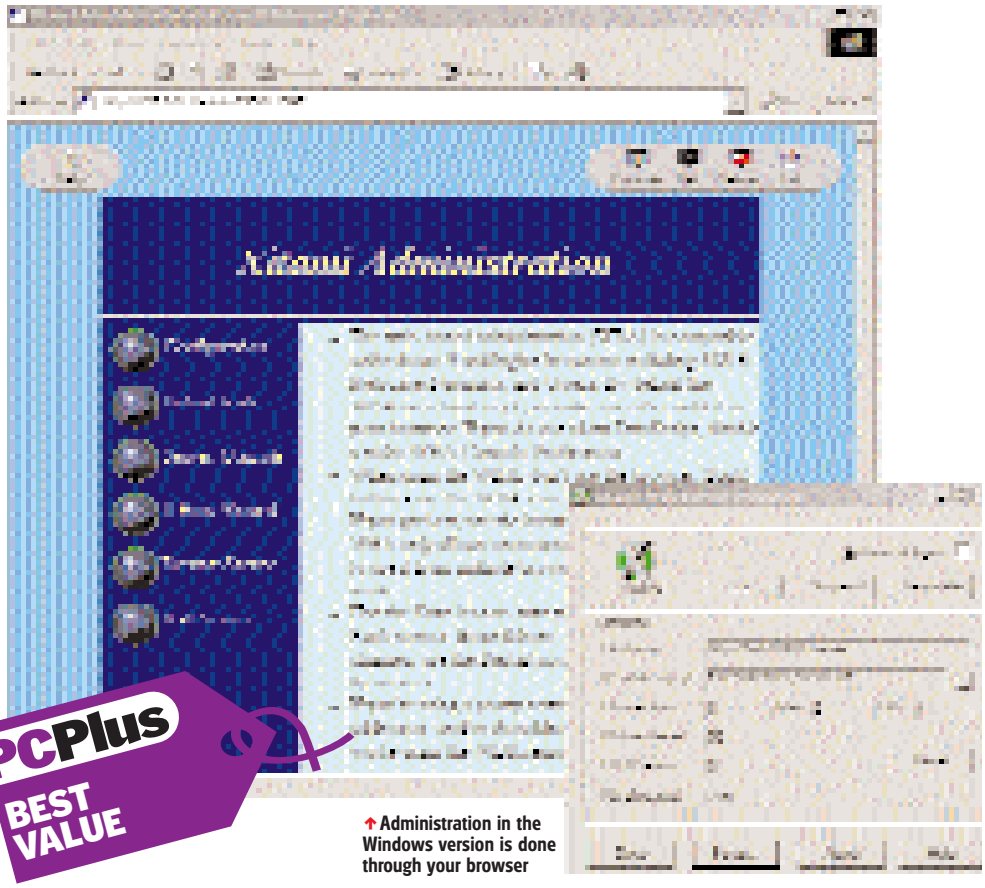
PCPlus Verdict

VERDICT HEAD

✓FOR
- → A wide-ranging and high-performance library of Internet components
- → Works under Linux
- → Free!

✗AGAINST
- → Documentation is poor or non-existent

Specifications	9
Quality	9
Performance	10
Value for money	10
OVERALL	**9**



PCPlus BEST VALUE

↑Administration in the Windows version is done through your browser

WEB SERVER

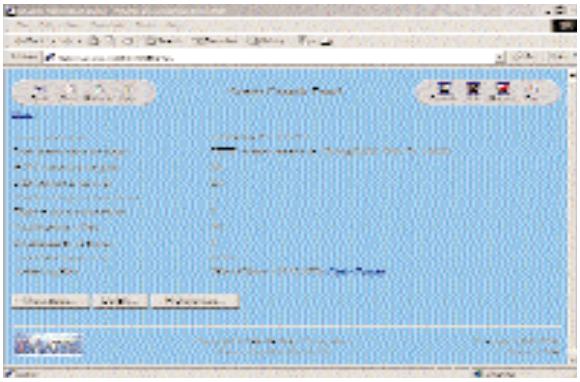
Xitami Web Server from IMatix

PRICE Free for the standard version. Commercial support has a monthly subscription charge
SUPPLIER iMatix **WWW** www.imatix.com

Xitami doesn't come with too much extra baggage, but it's fast and best of all free.

It doesn't matter if you're sailing a boat, racing a car or trying to win the Tour de France, if you can keep your power to weight ratio high you're going to get better performance. Much the same goes for Web Servers, cut out all the unnecessary bolt on goodies, work with a fast efficient kernel and you should get quick reliable performance. This is the thinking behind the Xitami server from iMatix, and I think that they may have got it right.

Xitami is freely available from their Web site and you can download a version for nearly every operating system with the notable exception of MacOS. It runs on all UNIX platforms, OS/2, OpenVMS, Windows 3.x, Windows 95/98, and Windows NT. Just to be difficult I downloaded the NT version and installed it on a Windows2000 server machine with the latest service pack installed.



↑By default the WBA (Web based administrator) uses JAVA so make sure it's turned on in your browser.

Requirements: Will run on most OS and doesn't need a fast machine.
Tested on: Athlon 700 with Windows 2000 and ISDN

From the minute you start it's obvious that Xitami is small. The self-extracting Windows executable file is well under 1MB and fits on a floppy.

Installation was quick and simple using the default settings. However, I had to close my existing 2000 server because Xitami shares the same default port. Most features can be modified but the default configuration should get you up and running without any problems. IMatix has developed the internal multi-threading engine used in their server. This has one added bonus; the software is so quick that it is viable to run on a slower machine, especially if you use the simple DOS or UNIX non-graphic versions, ideal if you want to resurrect an old 486 machine and set up a Web server running under DOS or Linux.

If you plan to play around with the server running under Unix or Linux, you can download the full source code kit but you'll need an ANSI C compiler to get it running. The Windows versions are also available as source and for this you'll need MSVC version 4 or higher. If you want to run it alongside an existing server using port 80, you can use an alternative HTTP port such as 5080 but you'll need to connect using http://localhost:5080/. The GUI Windows version installs it in the program manager and is simply started by clicking on an icon. However, if you want to run the console version, it can be run in a DOS box under Windows. It will give you instant screen messages that can be useful if you're debugging a tricky installation. There are reports that the console version is more reliable than the Windows version so if you're having any trouble you can switch over.

Server extensions can be added via Xitami's Web Server Extension Agents (WSX). These don't get loaded at runtime from DLLs but are incorporated into the Xitami executable. Xitami supports CGI programs in Perl, C, or any other language that your system supports. So, anything that you may have already written in a CGI program for web servers, such as Apache, should run unchanged with Xitami.

A commercial version of Xitami is available with a support fee charge of about £100 per annum. To get more information take a look at www.imatix.com. If you're into programming then they have some code generation goodies you might find useful. What do I think of it then? Well, along with many others who are in danger of becoming a cult, I must say that this is an impressive server. With a range of different platforms and a super fast HTTP and FTP engine it would hold its own against many commercial programs. To get it for the cost of a download is exceptional and it has to be one of the greatest freeware bargains you can pick up.

Paul Warner

PCPlus Verdict

XITAMI WEB SERVER FROM IMATIX

✓FOR
→ Comprehensive server with great performance

✗ AGAINST
→ Not a lot

Specifications 9
Quality 9
Performance 9
Value for money 10
OVERALL 9

SPECIAL REPORT

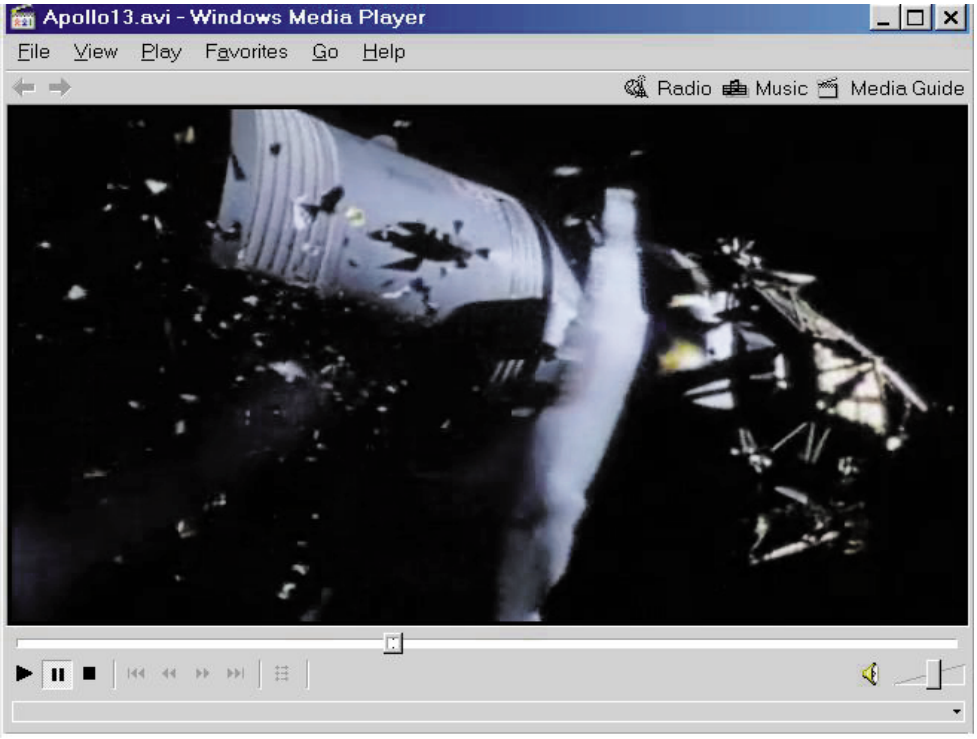
PIRATES TO CAUSE MOVIE MAYHEM?

➔The use of a hacked codec to compress and distribute DVD movies illegally has hit the IT headlines but this ignores its long term value. Jason Thomas reports

No one who regularly downloads movie files off the Web can fail to have noticed the popularity of an MPEG-4 codec (COmpressor/DECompressor) called DivX ;-) and the furore it's creating. And if you don't regularly download such files, it probably won't be long before DivX ;-) tempts you to have a go. The reasons are simple – the files are about one tenth the size of regular movie files with similar video quality to the original and the same audio quality as CD.

In fact many of the mainstream news sites have run stories to the effect that DivX ;-) is going to do to video what MP3 did to audio. *Time magazine*, the *Wall Street Journal, Scientific American*, and a host of other Internet news sites have all run articles focusing on the issue of DVD piracy. Indeed, if you believe most of this coverage, this format is set to become Hollywood's nemesis, inspiring us all to spend hours – even days – copying, compressing, and swapping illegal copies of DVD movies to watch at our leisure on our PCs. We'll never buy a legal DVD or video again.

But this analysis misses the point. While it's true you can use DivX ;-) to view illegally copied DVD movies with little degradation of either video or sound quality, it's hardly a best-use scenario for a technology that promises to point the way for broadband Internet video. Its real value is that it brings the prospect of quality video and audio on the Internet considerably closer. It could even prove to be a viable method of providing video on demand – if the Hollywood studios themselves decide to embrace the technology, rather than attempt to stifle it. What it isn't is a video form of MP3 – files of complete movies are still way too big for convenient download. While a typical DVD movie can be compressed by a factor of ten, it's still 600MB, which means a download time of several hours even with a T1, cable modem or DSL connection. It's not even worth contemplating with a regular dial up connection – even with unmetered access. Another disadvantage is that you have to watch the films at your PC, which few people really enjoy. Most prefer the comfort of their own living room and a large TV screen.



↑One of the most popular trailers on the Net is Apollo 13.

When MP3 first hit the Net, its impact was not only felt almost immediately, but increased exponentially. Within weeks sites dedicated to the swapping of pirated audio files had mushroomed and ordinary surfers felt the risk, time and fuss involved with copying, uploading and downloading audio files was acceptable enough to take part in what they saw as a revolution in the distribution of music.

That this isn't happening with DivX ;-) shows time is still a great barrier when it comes to the Internet. The rarity of sites offering full length DivX ;-) movies almost 12 months after it first appeared shows many people have neither the time nor the inclination for the kind of widespread swapping that goes on with audio files. Not when you can buy a legitimate DVD for a few pounds.

Of course there will always be those who will spend a long time searching for the first 'rips' (as the cognoscenti call them) of the latest blockbuster movies and downloading them – no matter what their quality – just as there will always be those who are prepared to smuggle camcorders into cinemas. And almost nothing anyone can do will stop them. But the point is the Hollywood studios don't really have to worry about such people – there aren't enough of them. Besides, video piracy is still far and away Hollywood's biggest headache.

Nevertheless, you will find lots of sites offering the DivX ;-) codec and DVD film trailers which give you a good idea of what the software is capable of. And if you've got a Pentium II 500MHz or above and a fast 3D accelerator video board chances are you won't be able to tell the difference. Of course you don't get any of the extras you get with DVD – chapter markers, slow-motion, frame-by-frame and so on.

DivX ;-) in its original PC form (it has since been ported to all other major platforms including Linux, BeOS and Mac) is a hack of Microsoft a codec released last year in the beta of Media Player 6 welded to MP3 to give the audio

soundtrack. The codec, which is based on early implementation of MPEG-4, can be used to compress video (usually DVD or MPEG-2) files and output them as AVIs, Microsoft's standard Video for Windows interface.

The reason it has appeared in an underground form (incidentally the creators called it DivX ;-) as a jibe at the failed Divx DVD movie rental format) is because Microsoft didn't put it in the final version of Media Player when it was released at the end of last year. Many on the beta programme were mystified as to why Microsoft decided not to release it. So one tester, Jérôme Rota, a digital video expert living and working in France, upset that he could no longer even play the files he'd created with the beta let alone make new ones, decided to hack the beta version and release it to the Internet community via a site dedicated to the purpose.

It's a bit of a mystery as to why Microsoft didn't release this codec and even product manager Amir Majidimehr doesn't really shed much light: "The codec used the standard Video For Window interface which meant that it could be used to create/play AVI files. Alas, this interface was way too limiting and we abandoned in the latest versions of the codec. Access to the codec now is only available in our SDK which can not be used to create/play AVIs. However, the same functionality can be achieved with our new file format, ASF."

While there are those who swear by the ASF file format as many of the discussion groups devoted to DivX ;-) and ASF testify, ASF just hasn't taken off in the way DivX has. Rota (who goes under the Net handle of Gej) believes it's simply the popularity of the AVI file format that has made DivX ;-) so successful. He hasn't heard anything directly from Microsoft about legal action concerning his hacking of their software. In fact he believes that DivX ;-) has resulted in more downloads of Media Player than ever before.

As for Microsoft, it says it is 'examining the legal options'. It might be spurred on by the recent decision from a US judge which ruled DeCSS (the software which cracks the superficial encryption on most DVDs) in contravention of the Digital Millennium Copyright Act and has prevent 2600.com (a celebrated hacker site) from providing links to the software on other sites. But there must be some concern at Redmond about geese and golden eggs.

Nevertheless there is obviously some hurt pride at Microsoft UK. David Weeks, the Windows ME product manager said: "They did not hack the codec. They changed the formatting of the codec to trick users and applications (such as Windows Media Player) into believing DivX ;-) is a new format. This is akin to answering the phone and pretending to be someone else. It is important to note that the people who created DivX ;-) took a short cut in using our Windows Media MPEG-4 video codec. If they had wanted to, they could have used another codec, or even written their own, and created software that produced similar results."

And here is the crux of the matter. It's all very well to download film trailers along with DivX ;-) to put it through it's paces – and debate the legal issues afterwards, but once there is Microsoft-free code, the world of quality video on the Internet, broadband video and eventually video on demand becomes a distinct reality.

There are currently two separate and independent projects underway both of which aim to produce Microsoft-free cross-platform code with slightly more efficient compression ratios than the current technology. One is called Project Mayo, which is working on DivX ;-) Deux and includes the expertise of Gej; the other is called 3ivX which is headed up by Jan Devos of Happy Machines.

"Many of the mainstream news sites have run stories to the effect that DivX ;-) is going to do to video what MP3 did to audio"

"At Project Mayo, we will serve everyone interested in seeing good-quality video on the Internet: families, movie students, indie producers, all the way up to the Hollywood major studios," said Gej. "Project Mayo will create the next generation of the DivX ;-) codec – a better, faster, nicer cross-platform video codec. We are also building a set of technologies to enable everyone to make, watch, and transfer broadband digital video."

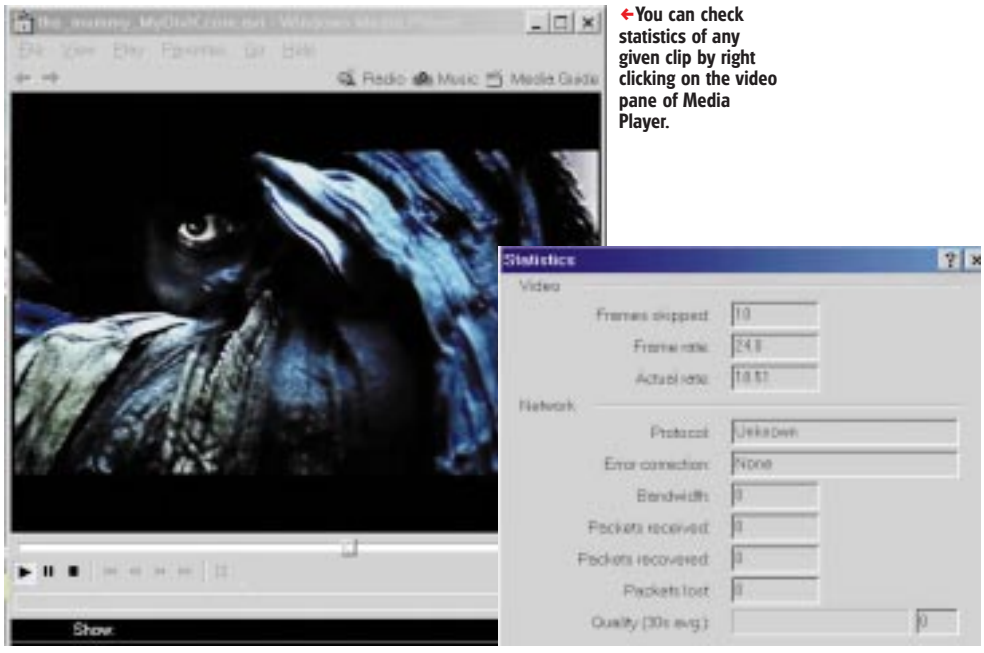
Jan Devos, who has worked with Gej since the first versions of DivX ;-), has enrolled Happy Machines into the MPEG forum and is focussing on an open source and completely legal codec. "One of the important things is that 3ivX will be completely legal. Our company, Happy Machines, joined the MPEG group for that reason," he said.

No mention of piracy anywhere from either of these two projects, and this is because they realise large scale piracy of the sort the mainstream press believes DivX ;-) will encourage won't happen simply because of the all the drawbacks. Unfortunately the Hollywood studios also read the mainstream press and believe they are under a dire threat from video pirates (they always do, it's their normal state of paranoia) and will probably do their utmost to stifle the technology, when their best bet would be to embrace it as just another form of film distribution.

Where to get it

You can get a copy of DivX ;-) from several sites – try mydivx.com or divx.ctw.cc to begin with. It's a quick download and an easy install (Gej includes a step-by-step guide to get you up and running. If you get stuck try one of the discussion groups on 3ivx.st for a few pointers. At the moment just about the only legal(ish) stuff you can download are film trailers. You can find full length movies (and, of course, the porn industry has already jumped on the bandwagon) if you search hard enough. Don't expect us to tell you where to start because it goes with out saying they're illegal.

To get the best out DivX ;-) you really need a Pentium II or III running at 500MHz. You also need a top-notch 3D accelerator card, otherwise you'll find you're dropping frames and the sound will be out of synch. PCP



←You can check statistics of any given clip by right clicking on the video pane of Media Player.

Full program

Eye2eye London

Paul Ravening goes off on a tour of London, without leaving his chair. It's the kind of exercise that he loves

Fancy a trip to London? It's always fun visiting our nation's capital. I do quite a bit of travelling up to the big smoke, and love seeing all the sites when I can. However, if you're fed up with travelling, bored of the train, or just marooned without fuel, there is another option: you can enjoy exploring London by armchair with Eye2eye London.

Eye2eye enables you to travel round the city among 403 full-screen photos. You are able to see all the main attractions, royal heritage, government and business – the list is almost endless. Next, leave the capital and take a quick round-coast trip to see Britain's furthest points.

Eye2eye London is a sister product to the Eye2eye Britain CD-ROM, with the same armchair travel system including all of its original innovative features such as stepping to explore, animated slideshow journeys. It's a full program with printing enabled and no time limit. It covers both Central and Greater London, plus the tips of Britain from Land's End to John O'Groats plus other regions. It's an on-screen holiday in the comfort of your own home.

This program, with over 400 beautiful photographs, is worth looking at for the pictures alone. However, it's not just the pictures, it's also what's been done with them that makes this program truly special. With the option of picking any area of London, exploring a specific category, or having a guided tour, Eye2eye becomes a resource for research purposes as well as a travel guide. From historic buildings, to modern office complexes, from seaside towns, to beautiful British countryside, the information is endless.

Transport yourself to a place with Eye2eye Britain's beautiful maps, then step N, E, S or W to the next place by clicking the compass keys or the cursor keys. The cursors are the easiest option, as they give you more control.

You can choose a set of images by text search, subject or area, then view your set by exploring, or you could just simply sit back and enjoy an animated virtual journey slideshow with music.

Whether you have difficulty travelling, or wondering where to go or what to do for the weekend, or you want to boost your score in your local pub quiz, whatever the reason for wanting to explore London, Eye2eye London is virtually all you need.

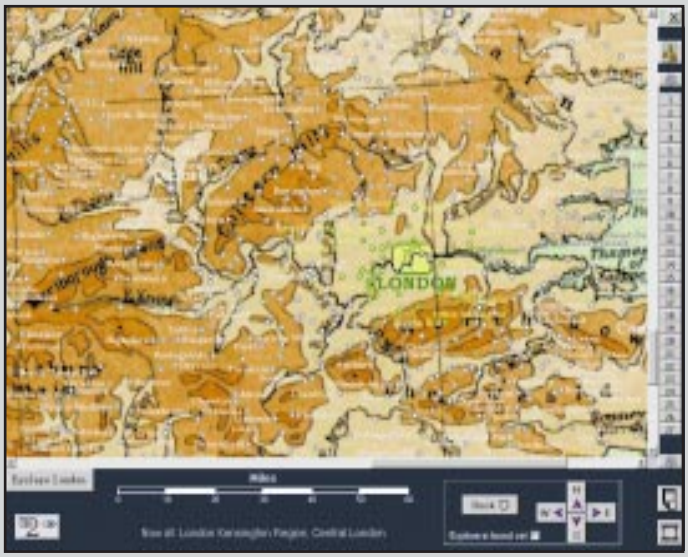
Getting started with Eye2eye London

Start your tour of our capital with a bit of help from PC Plus

1 This is the map screen you'll see when you start Eye2eye London. The yellow dots on the map are the places you can visit. Most of them are in London, but there are a few dotted around the country to give you a taste of England's glory.

2 Click on the area you wish to view and the program will zoom in. Here we've headed for Lands End. Double-click on the yellow dot which represents the area you wish to see, and off you will go.

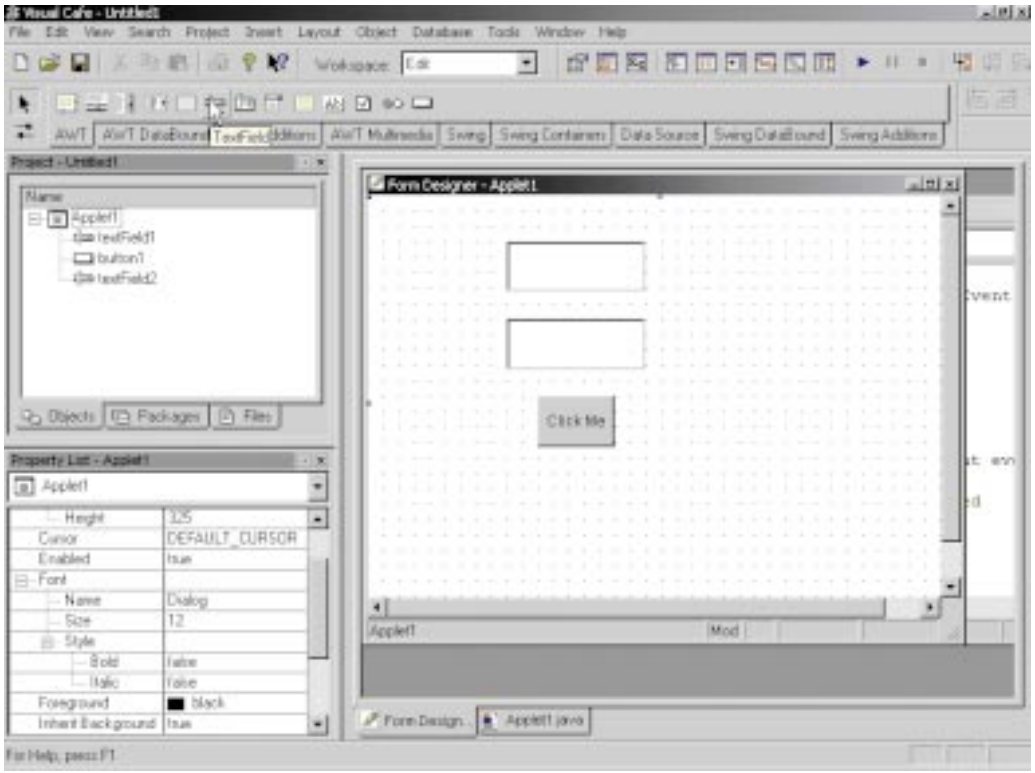
3 Here's a picture of a quaint English harbour in Cornwall. Lovely. Well, let's head for the big smoke next…



4 Here's the capital. As you can see, in addition to the yellow dots, the main area of London is divided into areas. I found it easier to use the cursor keys to cycle through the available areas. The photos available in that area are listed on the right-hand side of the screen

5 Click on a number and the corresponding picture is shown to you, along with some accompanied text. Sometimes photos are linked from within photos, such as a close up of Big Ben. The program will show them to you within a specified time.

6 So that's Eye2eye London. There's lots more you can do with the program, such as setting up slideshows, making picture collections and much more. Happy touring.



→Use Visual Café to create a user interface by dragging components on to an empty form. Tooltip hints display the name of components on the palette.

Full program

Visual Café 3 Pro

Use this development tool to debug and deploy Web applets and Java applications

This month we're pleased to bring you Visual Café 3 Pro. The product, now owned by Webgain is the first Rapid Application Development (RAD) tool designed for the Java programming language. Visual Café is a complete form based development environment that provides a rich set of 'What You See Is What You Get' tools and components that enable you to develop, debug and deploy high performance Web applets and stand-alone Java applications

To help you on your way, we've included Part 1 of our Java workshop from Issue 169 in case you missed it. Java is a great way into programming. Its syntax is modelled on the C language, so a familiarity with Java will be an advantage if you want to move on to C++ or Microsoft's new C# language later on. Unlike C and C++, Java is a relatively 'safe' language. In Java, the worst that's likely to happen when you make a mistake is that your program won't run. In C++ or Delphi, a single innocent mistake can crash your PC!

Café society

Without more ado, let's start coding. We'll be using the Visual Café 3 integrated development environment in this series. Visual Café is a superb programming system which combines a code editor, debugging tools and a drag-and-drop visual designer.

Start Visual Café now. Select its File menu, then click New Project. A dialog box lists several types of project. You don't need to understand the differences between these at present. Select AWT Applet and click OK.

After a few moments, a blank form will appear. You can now drag components on to the form from the tabbed palettes at the top of the screen. Make sure the AWT palette is selected. Find the TextField component. A pop-up tooltip gives the name of each component on the palette when you rest your mouse pointer over it for a second or so. Click TextField then click the blank form. This places an empty TextField onto the form. Now drop a Button from the palette onto the form.

You can use the given Property List to alter the appearance of controls on the form. Let's alter the caption on the button. Make sure button1 is selected. Click the text button to the right of Label in the Property List. Delete the text and enter:

```
Click Me
```

Note that the caption of the button on the form has now changed. Now let's add some program code. We'll start by writing the traditional Hello world program – one that displays the text Hello world in the TextField when the button is clicked.

Unforeseen events

Double-click the button on the form. A list of events is displayed in a dialog box. An event is anything that may trigger some action in a program. A key pressed on the keyboard is an event. So is a mouse click. Select the mouseClicked event. Then click the Add button. This causes Visual Café to write some of the code needed to deal with a mouse-click event. It displays this code in the editor:

```
void
button1_MouseClicked(java.a
wt.event.
MouseEvent event)
  {
    // to do: code goes
here.
  }
```

Look at the first line. Here, button1_MouseClicked is the name of this block of code. In object orientated languages such as Java, a discrete block of code like this is called a method. So this block is called the button1_MouseClicked method. In other languages, similar blocks of code are called procedures, functions or subroutines. When other parts of a program want to run code inside a method, they can do so by calling the method name.

For now, ignore the word void and the terms enclosed in brackets. The important thing to note is that the start and end of the method are indicated by the two curly brackets. So any code that we want to be run

or execute by the method must be placed between the opening bracket and the closing one.

At the moment, the method contains no executable code. This text is a comment:

```
// to do: code goes here
```

In Java any text placed after two forward slashes on a single line is ignored when the program is run. This gives you the freedom to document your code by adding explanatory comments as you go along. To document this method, change the text of the comment to the following:

```
// Display 'Hello world'
when button is clicked
```

Now move your cursor to the line beneath this comment but above the closing bracket. Since we want to put the text into the TextField control, we begin by specifying that control by name. The names of all the components on the form are displayed in the Project window at the top left of the Visual Café environment. The name of the TextField is textField1. Enter this into the editor:

```
textField1
```

Be careful that you have written the name exactly as shown. In common with C and C++, Java is a case-sensitive language. That means that it treats TextField1, textfield1 and textField1 as three different names. When referring to any object or calling a method, therefore, you must be careful to use the correct mix of upper and lowercase letters otherwise your code won't run!

Method madness

Components such as buttons and TextFields come with numerous ready-to-run methods. But in order to use a method, we have to find out what it is called. In Visual Café that's easy. Just put a full-stop after the name of the component in your code and wait a moment. Do it now. Add a full stop at the end of the text you just entered, like this:

```
textField1.
```

A list of methods and properties will now appear. In Java, methods that set the values of a component usually start with set and those that get value from components start with get. To search the list of properties, enter the text set. Scroll down until you find setText(String) and double-click it. Visual Café completes our code as follows:

```
textField1.setText(String)
```

To call a method in Java, you must put round brackets after the method name. Here the brackets contain the word String. This is a reminder that the setText() method expects us to send it some String data to display. In programming jargon, a piece of text is called a String because it's made up of a string of characters. In Java, a string is enclosed between double-quote marks. Edit the code as follows:

```
textField1.setText( "Hello
world" )
```

Now try running the program. You can do that by pressing [CTRL][F5] or by clicking the blue arrow-head towards the right of the toolbar at the top of the screen. Oops! There's a problem. A message pane says Build failed. In other words, Visual Café hasn't been able to create a runnable version of the program. Higher up in the pane is another message, which states the nature of the problem. It says: Error, then the directory path and name of the code file, " ' ; ' expected'.

You can double-click an error message to find the problem line in source code. Not surprisingly the line turns out to be the one we've just written. In Java (as in C++ and Delphi), individual code operations or expressions must be terminated with a semi-colon. Add a semi-colon to the end of the line:

```
textField1.setText(String);
```

Now the program should run without errors. If this is the first program you've built, a dialog box prompts you to accept various licensing terms. Click the button to accept them before continuing. Your program – or Applet – should now appear. Test it by clicking the Click Me button. All being well, the TextField will now say Hello world. Let's rewrite this so that it greets the user with his or her own name.

Smooth operators

Close the Applet window. In the form designer, drop a second TextField from the AWT palette onto the form. Go into the code editor and edit the method as shown below:

```
void
button1_MouseClicked(java.a
wt.event.
MouseEvent event)
  {
    // Display 'Hello
world' when button is
clicked
    String greeting;
    greeting =
textField2.getText();

textField1.setText("Hello "
  + greeting);
  }
```

Run the Applet. Now click the button. If textField2 is empty, the text in textField1 will be set to Hello. Enter your name into textField2. Click the button again. When I do this, textField1 says Hello Huw. It should greet you with your own name. The secret here resides in that greeting thing:

```
String greeting;
```

Here greeting has been declared to be a variable of the type String. A variable is, in effect, a container for data of the type specified. Think of a variable as an empty box. The greeting variable is a String-sized box so it can only contain String data. If you try to put an integer into it, you will cause an error. You can, of course, declare variables of other data types too. For example, this is how you would declare an integer (an int for short) called mynumber:

```
int mynumber;
```

The code in my re-written method gets the text from textField2 using the getText() method and assigns it to the variable greeting. You assign a value to a variable in Java by using the equals symbol which is the assignment operator:

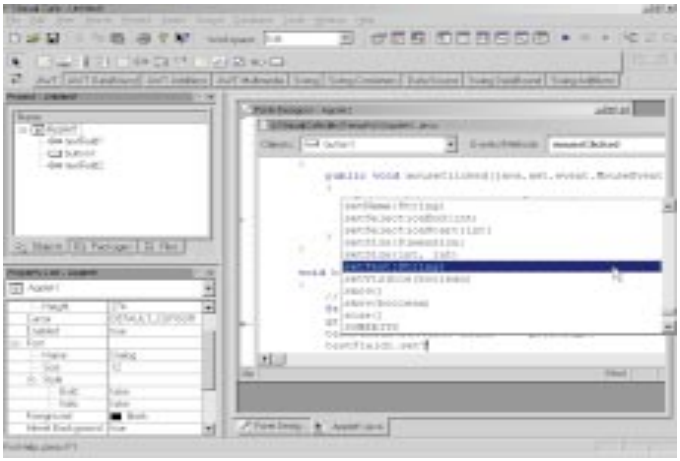
```
greeting =
textField2.getText();
```

Having assigned one value to the greeting variable you can subsequently assign different values by entering new text into textField2 and clicking the button.

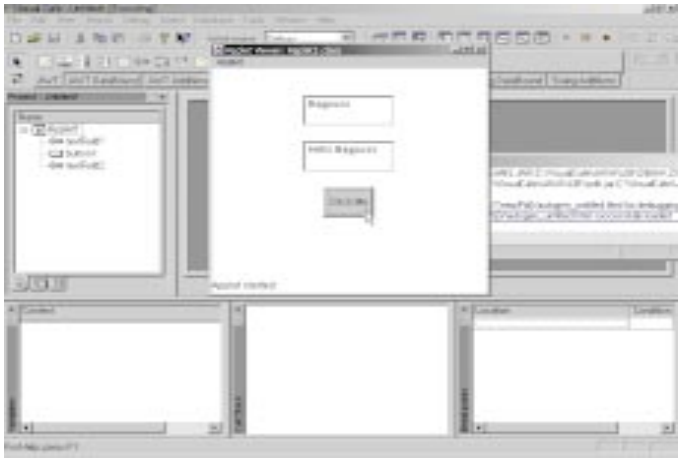
Before displaying text in textField1, we add the data stored in the greeting variable to the end of the String, Hello using a plus (+) symbol. In Java, the plus symbol acts as the addition operator when working with numbers and the concatenation operator when working with Strings:

```
textField1.setText("Hello "
  + greeting);
```

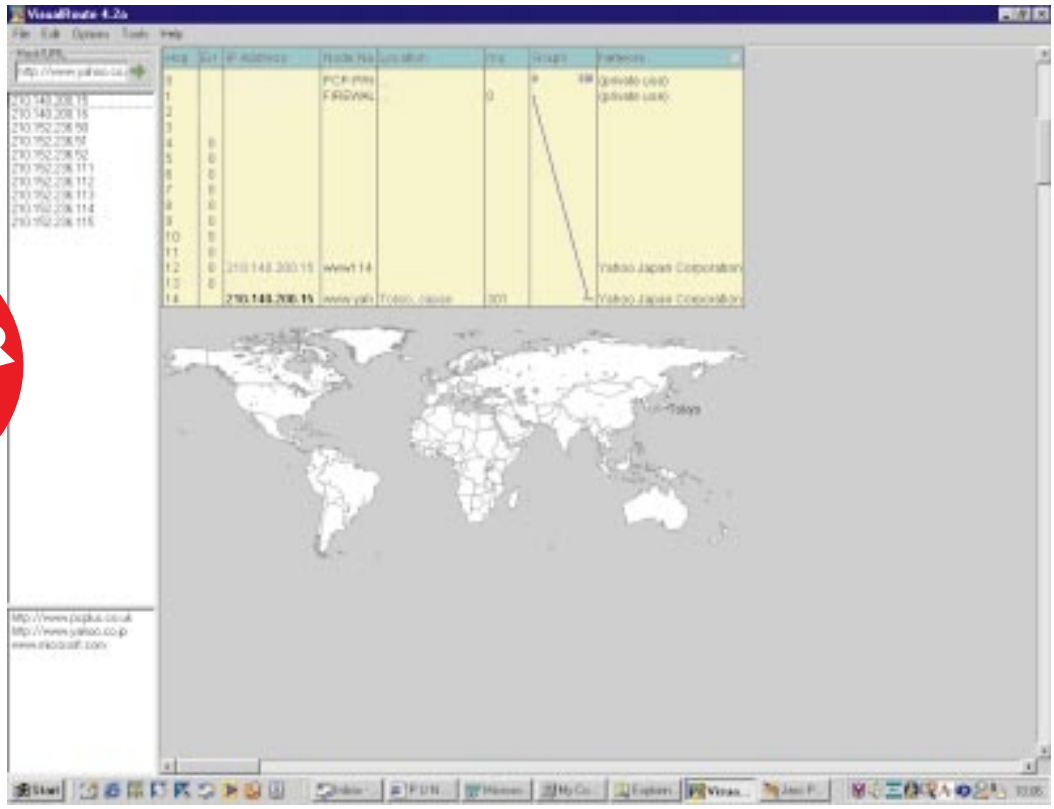
Simple as it is, our little Hello World program has introduced most of the fundamental features of programming including events, methods, variables and operators.



↑Enter a full-stop after a component name in the editor and this pop-up list lets you complete your code by selecting the name of a method or property.



↑Our final Applet greets the user with his or her name. It may look simple yet it illustrates most of the fundamental features of Java programming.



➔It's easy to get the hang of. Here we are pinging Yahoo Japan. Please note, certain numbers have been hidden to protect the innocent, your table won't look this blank.

PCPlus SEE YOUR SUPER DISC

Traceroute software

VisualRoute 4.2a

Identify Internet bottlenecks and see the route data takes from a remote server to your PC with this handy diagnostic tool

Did you know that if you direct your web browser to www.aol.co.uk, the web page is accessed from a server on the East coast of the USA? Or, that the data from a server in Russia might take several hops on its route to your PC, via Stockholm, Copenhagen, Amsterdam, Brussels and London?

VisualRoute provides this information which will help to identify reasons why data might be taking a long time to reach your PC.

When you first run the software, you'll be prompted to enter a registration code. Enter the number as requested and then click Run. Please note there are two separate types of licence. The first is the VisualRoute client, which is intended for stand-alone machines. The other is for the VisualRoute server, which can be installed on a central system. Network users can then connect to it and run traceroutes through a web browser. The server option is useful in environments with firewalls that normally block the ping and traceroute data.

Once you've registered the software, open up your Internet connection and enter the address of a server you wish to check, for example, www.pcplus.co.uk. Now click the green arrow and VisualRoute goes to work, starting the traceroute to the first IP address in the list. As the software works, you'll see a table of server IP names, addresses and locations appear above the world map.

The 'Err' column tells you the amount of packets that have been lost at this hop level and the number is red if a host is discovered here. This means ping packets are being lost. Otherwise, this number is black because the host may be ignoring ping packets. This number is updated as the trace goes on.

The 'ms' column displays the average number of milliseconds it took for the ping to go from your machine to this hop level, and back again. Clicking any of the locations in the Network column opens up a box with information about the server and a contact address.

Above the traceroute box is the analysis box, which tells you how many hops it took to reach the server and where any problems occurred. The traceroute is also displayed on a World map. Links drawn in blue indicate known locations. Links in purple indicate a guess was made. VisualRoute re-draws the map and new information becomes available from the traceroute. You can zoom in and out of the map by clicking chosen areas and move the map within the screen by dragging it with the mouse.

VisualRoute is fast, easy to use and provides a wealth of helpful and intriguing information. If you've ever wondered why you can't reach a particular server, VisualRoute will tell you who is to blame.

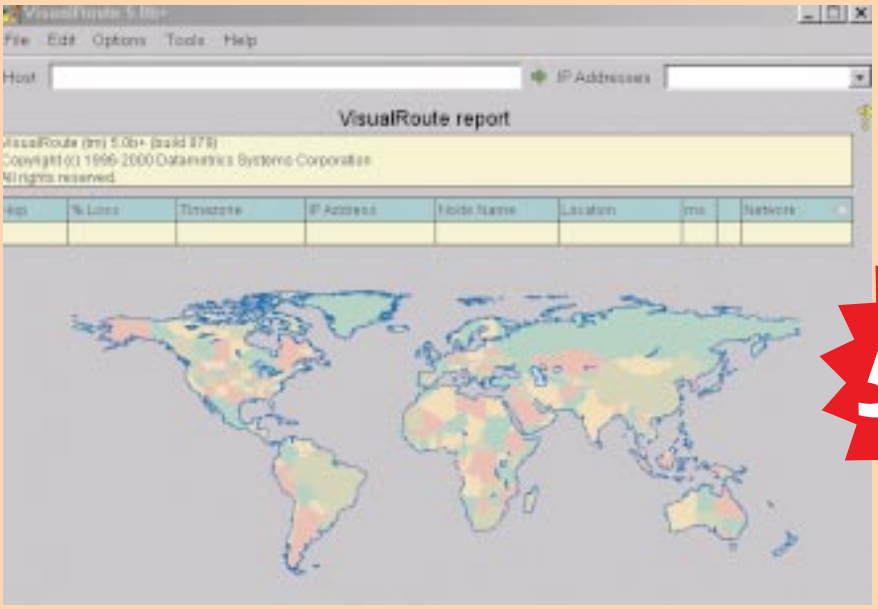
Paul Ravening

➔Codes

For stand-alone machines and networked systems

Client
L-084903246-1-98AF

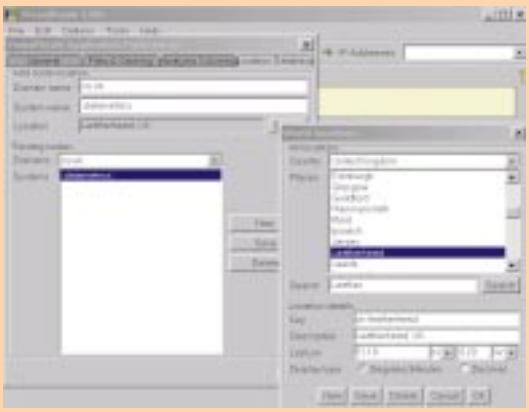
Server
L-5826895-101-72CC



Upgrade to VisualRoute 5.0

Save 50 per cent when you upgrade to VisualRoute 5.0

VisualRoute is an ideal tool for Webmasters and surfers alike. It enables you to test and investigate connectivity problems with your site and ISP and find out where things are going wrong. As well as offering the full version of VisualRoute 4.2a on this month's **Superdisc**, we can also supply you with this amazing offer.



How to order:

VisualRoute 5.0 is normally sold for $37.50 (about £25) but as a special **PC Plus** offer you can upgrade for just $18.50 (about £12.50). To upgrade, visit our website at www.visualroute.com/download.html?afficlate-pcplusmaguk

VisualRoute 5.0 offers:

New coloured zoomable maps
All countries and US States are labelled and major towns and cities are shown too. It is also possible to change the colours of the map.

AutoZoom option
This enables the map to zoom automatically so it shows all the locations of the current trace. The area being displayed updates automatically as new locations are resolved.

Improved layout
A new toolbar at the top of the screen allows more space for the map.

Customisable ping packet size, number of pings and timeouts
These options enable more detailed analysis and testing of routes.

TimeZone information

Support for hex incoded IP addresses
Many spammers and illicit Web sites give their URL in a hexidecimal format. VisualRoute can now resolve those sites.

Who is...?
Lookups can now be done using the VisualRoute Server.

Order at **www.visualroute.com/download.html?afficlate-pcplusmaguk**

→ At the time of writing this, it's a novelty to see cars driving round! Bet these guys can find petrol.

PCPlus SEE YOUR SUPER DISC

Town planning game

Mobility

"We're on the road to nowhere.." And so will you be if you let your plans go astray in Mobility

Driving into Bath on a wet and windy Monday morning, it's easy to see why there is so much road rage in Britain. Admittedly, some drivers do have a part to play in this, but the main reason for this is planning. Or lack of it.

Just by sitting outside our office for a few minutes, you're bound to see a car or two trundling round the wrong way of the one-way system. But you can't blame them; it's so confusing out there. Do you think that you can do better? Well, you probably can. And now you've got the chance to prove it.

↑ Mobility allows you to plan your own town or city with up to 300,000 inhabitants. As in real-life, the normal traffic laws apply, even these guys get prosecuted.

Mobility reminds me very much of that old classic, *Transport Tycoon*. In that game, you had to build a city, along with its industry and residential areas. After that you created its transport infrastructure from the ground up. Mobility takes this idea and improves it immensely. You've got complete control, from setting speed limits to running Park and Ride services. It's a huge game.

The game itself comes with a full-blown manual, and believe me you'll need it. It's in Adobe Acrobat format, so you'll need Adobe Acrobat to see it. Find it on the **SuperDisc** in the folder FULL/MOBILITY. That really is your best source of information.

You will find yourself confronting the issue of mobility as soon as you start playing. You'll have to consider how to proceed – which houses, factories, streets and stations etc. to build. You'll find yourself more aware of the issues associated with traffic.

This will allow you to relate mobility and traffic to one another and be able to understand them better. That should motivate you to be more aware when dealing with traffic issues. We associate car, bus and bicycle with these two concepts.

But that only represents a small selection available to us. For example, a car driver is able to head for a Park and Ride facility, and leave his or her car there in order to continue on to their destination using bus or rail. Mobility centres and car sharing systems are also on offer for a fee – thus increasing the options available.

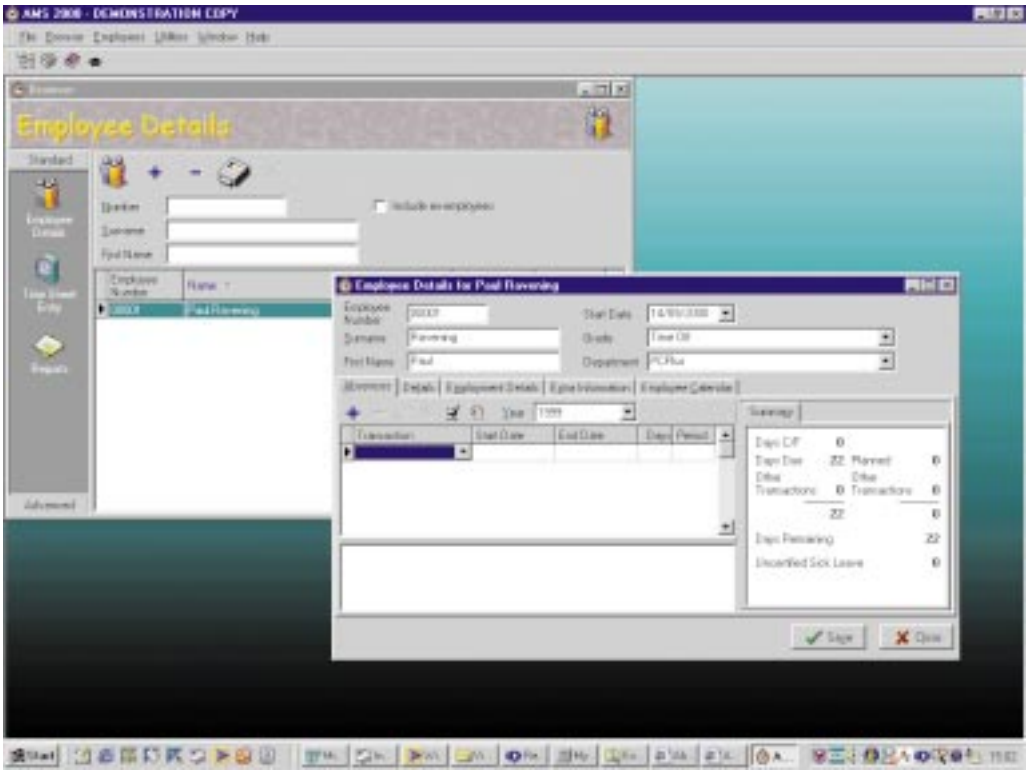
Your game world consists of a city with a traffic infrastructure that you design. Your city may have up to 300,000 inhabitants and corresponds to a diameter of 13 miles.

The city that you create is populated by traffic users, planners and service providers.

Your city inhabitants constitute the group of traffic participants/users. They react to traffic infrastructure that you as a planner create. This means they are themselves able to select transport means. In addition, they determine their location and select a desired destination. As in real life, they must obey all applicable laws if they want to avoid prosecution.

You, as the planner, determine the city's structure. You can control all aspects which have a direct or indirect bearing on traffic behaviour. You're responsible for developing streets, rail routes, parking spaces, residential areas, shopping centres, stops and stations, mobility centres and the like. It's a tough job, but someone's got to do it. And if you think you can do better than your city planners, go and prove it to them.

Paul Ravening



PCPlus SEE YOUR SUPER DISC

Employee database

Absentee Management System 2000

AMS 2000 is a powerful product that provides assistance in keeping track and analysing the attendance of staff members

AMS price details for larger companies

Whether you have two employees or 200, AMS will help to keep track of all staff absences

These prices are quoted for single user licences, based on the number of employees to be stored on the database

No. of employees	Price
11 to 25	£100
26 to 50	£165
51 to 100	£265
101 to 250	£410
250+	Please call

Extractor, which enables you to develop customised reports for AMS 2000, is available as an add on and is priced at £80. Minor upgrades will be free for registered users, who will also get unlimited fax/e-mail support and 60 days free phone support.

AMS 2000 enables you to maintain an accurate employee database containing all the relevant information such as personnel details, employment information and relevant dates in employees personal calendar

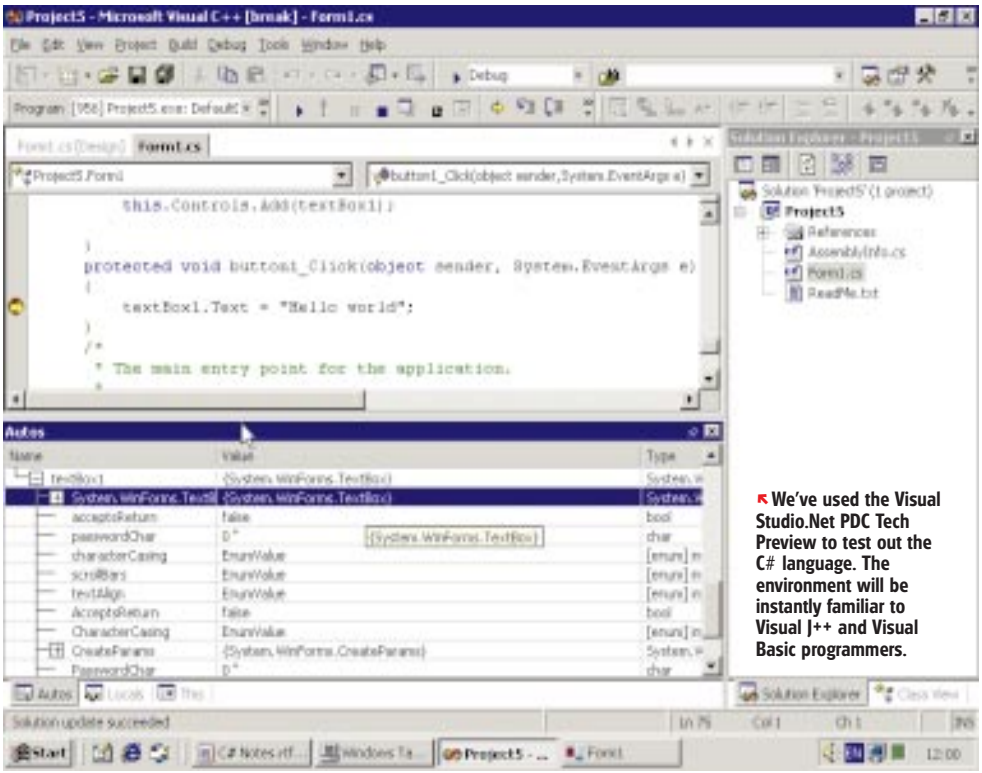
This system allows you to access absences using different criteria and prepares professional but easy to read reports. The version on this month's **Superdisc** is for one to ten employees, perfect for a small company.

With AMS 2000 you can organise your time by keeping a detailed record of employees holidays and days off as well as planning your own activities.

The system can provide analysis of the main reasons for absenteeism using the reports generated. AMS can also analyse the attendance by individual departments to help increase your productivity. Use this information together with your performance reports and devise the strategy to boost your company's potential.

The user interface of AMS 2000 has been designed so you don't have to go through complicated procedures to enter and view any information. A powerful search engine makes locating employees easier by applying different criteria to conduct the search. There is an import facility available which enables you to import personnel data which you might of stored on some other system which saves re-entering the data.

If you wish to purchase additional licences, see the offer.



We've used the Visual Studio.Net PDC Tech Preview to test out the C# language. The environment will be instantly familiar to Visual J++ and Visual Basic programmers.

UNDER DEVELOPMENT

Microsoft C#

Microsoft's new C# language aims to provide the best of both C++ and Java. Is it aiming too high? Huw Collingbourne finds out

Over the past couple of years rumours have continued to circulate about a new Microsoft programming language that would either be a superset of Java or a subset of C++. That language was officially announced a few months ago. It is called C# (pronounced C-Sharp) and it will be released as part of the Visual Studio.Net suite which is expected to ship towards the end of the year.

So what is C#? The official Microsoft line is that it is the natural successor to the C++ language. "C# is designed to bring rapid development to the C++ programmer," says one Microsoft document, "Developers familiar with these languages can quickly become productive in C#".

In fact, this tells only half of the story. It seems to us that the resemblance of C# to C++ is pretty superficial. While the languages share a similar syntax, they embody fundamentally different programming methodologies. C++ is a hybrid language which bolts Object Orientated Programming (OOP) features onto the venerable C language. C#, on the other hand, is a pure OOP language. In C# it is obligatory to embed all variables and functions inside classes from which objects are created. There is no such thing as a global variable or a stand-alone function.

While this makes C# both simpler and more elegant than C++, it necessarily means that the two languages are incompatible. Translating an existing C++ project into C# would not be a trivial undertaking. Indeed, in our opinion, C# seems to have more in common with Java than with C++. Both Java and C# are fairly rigorous OOP language with a C-like syntax and built in garbage-collection for automatic memory reclamation.

All at C

While C# can be used as a general purpose programming language for the creation of traditional applications, Microsoft is promoting it as the perfect tool for developing Internet applications for its new .NET platform.

To begin work on a project you can select from one of several project types such as Windows Application or Class Library. C# has wizards to help create Internet enabled ActiveX controls, Web services and applications.

A wizard automatically generates the code needed for a basic application. You can then design its user interface using form or Web-page design tools similar to those provided in the current releases of Visual Basic and Visual J++. A multi-page toolbox groups together drag-and-drop components. A hierarchical properties list lets you alter the look and feel of components on the form.

The C# code of the interface is auto-generated. The editor has built-in code-completion tools to let you select properties and methods of a control from a drop-down list. From start to finish we designed, wrote, compiled and ran our first C# program (the ever popular 'Hello world') in under a minute. To illustrate the simplicity of this, here is the user-entered code in its entirety:

```
textBox1.Text = "Hello
world";
```

When designing Web applications you can use an outline view of HTML objects (such as DIVs and SPANs) which lets you navigate the code. There is also a built-in Web page previewer which displays the layout of the page including layers and graphics.

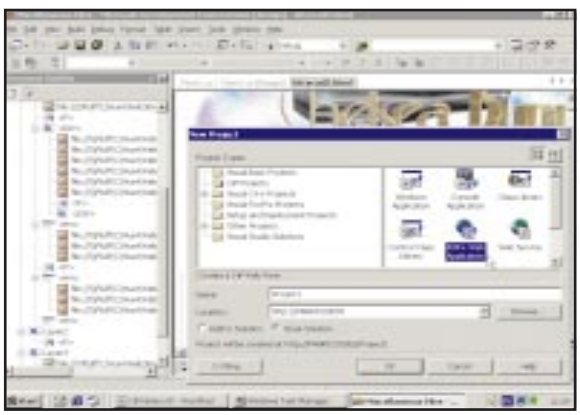
At the sharp end

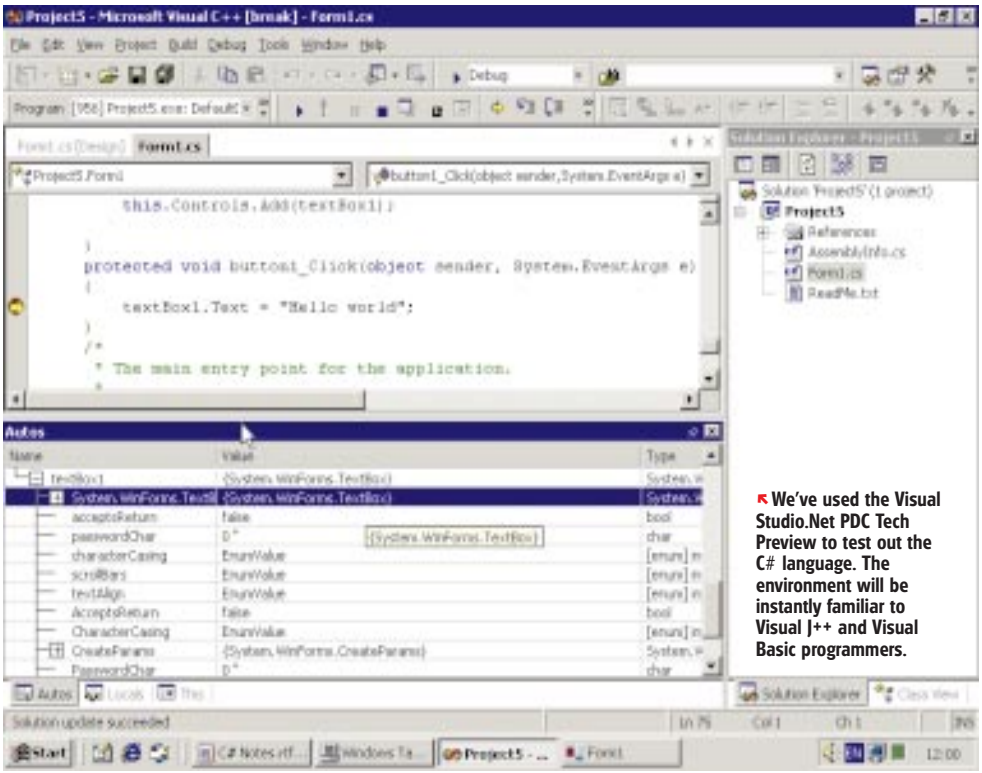
Crash-proof programming is one of the major issues addressed by the C# language. In C++, the careless use of pointers is probably the most common source of bugs. In common with Java, C# removes this problem by eliminating pointers by default. Unlike Java, it also provides an option to use pointers within specially marked blocks of code, so that the Windows API can be accessed easily with compromising program efficiency.

One consequence of disabling pointers is that the programmer cannot use method-pointers to direct event-handling to specific functions. This is useful if, for example, an application were to create 100 file-launching buttons at run-time. Instead of creating a ButtonClick handler for each button, you might want to use a single function called, say, Launchfile(), to be shared by all 100 buttons. To do this you would need to associate the OnClick event with the Launchfile() function. Instead of method pointers, C# uses delegates. These provide essentially the same capabilities as method pointers but with the added benefit that delegates are type-safe and less error prone.

While the software supplied to us is still in the early stages of development, it looks as though C# has the makings of a powerful language which genuinely does make up for many of the limitations and deficiencies of both C++ and Java. We eagerly await further developments. PCP

There are wizards to create both Windows and Web applications. Notice the integrated Web page preview and the HTML outliner which is docked at the left edge of the screen.





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